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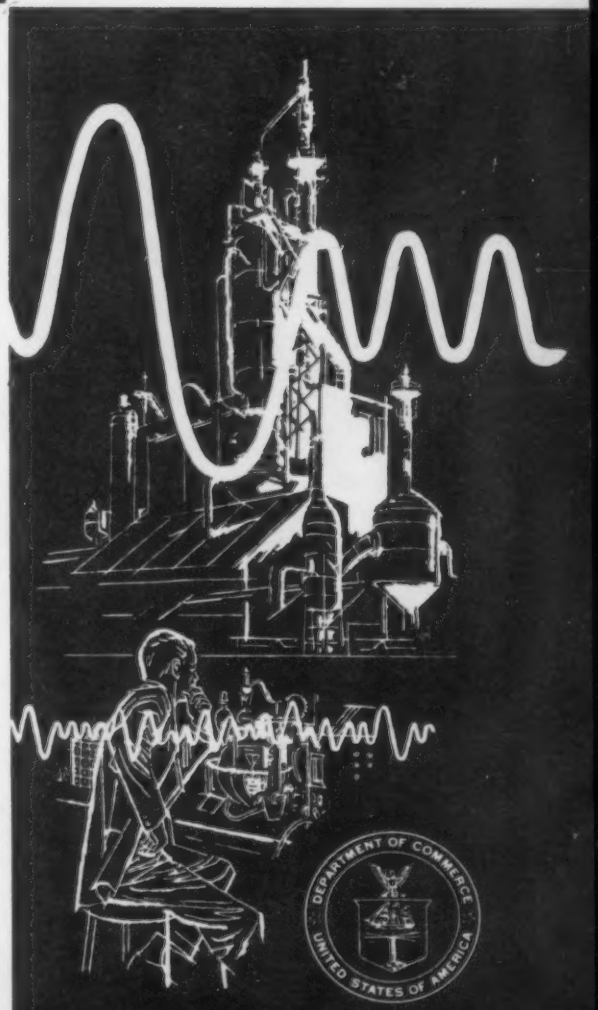

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NORTH AMERICAN AVIATION, INC., COLUMBUS, OHIO.
AD-273 713 62-2-6 DIV. 17

(MATERIALS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; PHYSICAL PROPERTIES; TEST METHODS.) (*ADHESIVES; RESIN ADHESIVES; RUBBER ADHESIVES; *LAMINATES; RESINS; PLASTICS; GLASS TEXTILES; *SEALS; *SEALING COMPOUNDS.) (*ALLOYS; *STEEL (4130; 15-7PH, 4340; 300M); *STAINLESS STEEL (AM 350; A286, AM 355; 321; 422; PH 15-7 MO; 17-4 PH); *ALUMINUM ALLOYS (7075-T73; X2219-T6); VANADIUM ALLOYS.) (HONEYCOMB CORES; SANDWICH CONSTRUCTION; BRAZING; SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X; RENE' 41; M-252; INCONEL 718); CHROMIUM ALLOYS; COBALT ALLOYS; MOLYBDENUM ALLOYS; *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***ALUMINUM ALLOYS**

(ALLOYS; *ALUMINUM ALLOYS (2024; 2014; 7075; 5052; 5086); WELDING; *SPOT WELDING; *ELECTRIC WELDING; RESISTANCE; MANUFACTURING METHODS; AUTOMATION FOR QUALITY CONTROL.) (EFFECT OF ELECTRODES, GROOVE, TIME; THICKNESS; ELECTRIC CURRENTS ON ELECTRICAL PROPERTIES; *RESISTANCE OF SPOT WELDS.) TABLES.
BUDD CO., PHILADELPHIA, PA.
AD-273 477 62-2-6 DIV. 26

(MATERIALS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; PHYSICAL PROPERTIES; TEST METHODS.) (*ADHESIVES; RESIN ADHESIVES; RUBBER ADHESIVES; *LAMINATES; RESINS; PLASTICS; GLASS TEXTILES; *SEALS; *SEALING COMPOUNDS.) (*ALLOYS; *STEEL (4130; 15-7PH, 4340; 300M); *STAINLESS STEEL (AM 350; A286, AM 355; 321; 422; PH 15-7 MO; 17-4 PH); *ALUMINUM ALLOYS (7075-T73; X2219-T6); VANADIUM ALLOYS.) (HONEYCOMB CORES; SANDWICH CONSTRUCTION; BRAZING; SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X; RENE' 41; M-252; INCONEL 718); CHROMIUM ALLOYS; COBALT ALLOYS; MOLYBDENUM ALLOYS; *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***ALUMINUM COMPOUNDS**

(*RADOMES; CERAMIC MATERIALS; *ALUMINUM COMPOUNDS, *OXIDES; MANUFACTURING METHODS; PROCESSING; MOLDING; CASTING; HEAT TREATMENT; INDUSTRIAL EQUIPMENT; HYDRAULIC PRESSES.) (PHYSICAL PROPERTIES; ELECTRICAL PROPERTIES.)
SHEARGO CHINA, INC., NEW CASTLE, PA.
AD-273 584 62-2-6 DIV. 6

***AMIDES**

(*POLYMERS; RESINS; ION EXCHANGE RESINS; *ESTERS; *AMIDES; ORGANIC ACIDS; SYNTHESIS; CHEMICAL REACTIONS; REACTION KINETICS; HYDROLYSIS; IONS.) (HYDROXIDES; METHYL RADICALS; ANILINES; ACETYL RADICALS; AMINES; ETHYL RADICALS; HYDROGEN COMPOUNDS; PHTHALATES; CARBOXYLIC ACIDS; PHENYL RADICALS.) (ENZYMES; CHLORINESTERASE.)
POLYTECHNIC INST. OF BROOKLYN, N. Y.
AD-273 648 62-2-6 DIV. 14

***ANALOG COMPUTER**

(*AIR TRAFFIC CONTROL SYSTEMS; *DATA PROCESSING SYSTEMS; *ANALOG COMPUTERS; PROGRAMMING; VIDEO NETWORKS; DISPLAY SYSTEMS; RADAR EQUIPMENT; CONTROL SYSTEMS; DESIGN.) (*AIR CONTROL CENTERS; AIRPORT RADAR SYSTEMS; AUTOMATIC; RADAR TRACKING; RADIO BEACONS; RADAR SIGNALS; VIDEO SIGNALS; COMPUTERS; ELECTRONIC CIRCUITS, ELECTRONIC EQUIPMENT; INSTRUMENTATION.)
TASKER INSTRUMENTS CORP., VAN NUYS, CALIF.
AD-273 545 62-2-6 DIV. 30

***ANALOG-TO-DIGITAL CONVERTERS**

(*THEODOLITES; MOTION PICTURE CAMERAS.) (*ANALOG-TO-DIGITAL CONVERTERS; DIGITAL COMPUTERS; DATA PROCESSING SYSTEMS.) (TRACKING TELESCOPES; POSITION FINDING.)
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 663 62-2-6 DIV. 29

(*ANALOG-TO-DIGITAL CONVERTERS; *DIGITAL COMPUTERS; *DATA PROCESSING SYSTEMS; RECORDING DEVICES; CODING; PROGRAMMING; PUNCHED CARD METHODS; MAGNETIC TAPE.) (NECN; SWITCHING CIRCUITS; TRIGGERED GATES.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 669 62-2-6 DIV. 30

***ANTENNA RADIATION PATTERNS**

(SONAR, *ANTENNA RADIATION PATTERNS; VERY LOW FREQUENCY; *TRANSDUCERS; CALIBRATION; TESTS; MEASUREMENT IN WATER TUNNELS; TEST FACILITIES.) (ANTISUBMARINE WARFARE; *SONAR EQUIPMENT; SCANNING SONAR; DIRECTION FINDING; PRESSURE; PHASE MEASUREMENT; DETERMINATION.) *ELECTROACOUSTIC TRANSDUCERS.
DEFENSE RESEARCH LAB., U. OF TEXAS, AUSTIN.
AD-273 522 62-2-6 DIV. 6

***ANTENNAS**

(*WAVEGUIDES; *ANTENNAS; ANTENNA RADIATION PATTERNS; TRANSMISSION LINES; EXCITATION.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 598 62-2-6 DIV. 8

(THEORY OF RHOMBIC; *ANTENNAS FOR DETERMINATION OF THE *ELECTROMAGNETIC WAVES; *RADIOFREQUENCY; SENSITIVITY; HAZARDS AND SAFETY; DISTANCES FOR *ELECTRIC DETONATORS.) RADAR EQUIPMENT; ELECTROMAGNETIC FIELDS; HAZARDS.
AMMUNITION GROUP; PICATINNY ARSENAL, DOVER, N. J.
AD-273 668 62-2-6 DIV. 22

(*MICROWAVE PROBES; *PLASMA PHYSICS; *ANTENNAS; *WAVEGUIDE WINDOWS.) (*REFLECTOMETERS; OSCILLOGRAMS; *WAVEGUIDES; ATTENUATION.) (INSTRUMENTATION; DESIGN UNDER FLIGHT TESTING.) (BOUNDARY LAYER; SHOCK WAVES; PROPAGATION; WAVE TRANSMISSION.)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 740 62-2-6 DIV. 25

(WAVE TRANSMISSION ALONG *TRANSMISSION LINES; *ANTENNAS.) (GEOMETRY; FUNCTIONS; POLYNOMIALS; TAYLOR'S SERIES; FOURIER ANALYSIS.) (ELECTRICAL PROPERTIES OF TRANSMISSION LINES; IMPEDANCE.)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 761 62-2-6 DIV. 25

***ANTISUBMARINE WARFARE**

(*BIBLIOGRAPHY; *ANTISUBMARINE WARFARE; *SUBMARINES; *TORPEDOES; *OCEANOGRAPHY.) (UNDERSEA WARFARE; CONTROL SYSTEMS; NUCLEAR PROPULSION; SUBMARINE PERISCOPES; SUBMARINE NOISE.)
AUTONETICS, DOWNEY, CALIF.
AD-273 660 62-2-6 DIV. 31

***ARCTIC REGIONS**

(*OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS; ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY OF SEA WATER.) OCEANOGRAPHICAL CHARTS.
WASHINGTON U., SEATTLE.
AD-273 924 62-2-6 DIV. 2

(*TABLES FOR *OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS; ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY; SEA WATER.) (WEATHER FORECASTING; WIND; CLOUDS; VISIBILITY.)
WASHINGTON U., SEATTLE.
AD-273 925 62-2-6 DIV. 2

***ARSENIDES**

(HIGH TEMPERATURE RESEARCH; *SEMICONDUCTORS; *GALLIUM COMPOUNDS; *ARSENIDES; *PHOSPHIDES; INTERMETALLIC COMPOUNDS.) (CRYSTALS; GROWTH; CRYSTALLIZATION; PRESSURE; ELECTRICAL PROPERTIES; RESISTANCE.) (TRANSPORT PROPERTIES; ARSENIC VAPORS; CHEMICAL IMPURITIES; CARBON.)
DAVID SARNOFF RESEARCH CENTER, PRINCETON, N. J.
AD-273 845 62-2-6 DIV. 29

***ARTILLERY ROCKETS**

(ROADS, TRANSPORTATION; TESTS OF *TRAILERS FOR *ARTILLERY ROCKETS FOR THE DETERMINATION OF STRUCTURES; STRESSES.) (STRAIN GAGES; INSTRUMENTATION.)
ORDNANCE MISSION; *WHITE SANDS MISSILE RANGE, N. MEX.
AD-273 712 2-2-6 DIV. 11

***ATMOSPHERE**

(RE-ENTRY VEHICLES, *OPTICAL TRACKING; *INFRARED TRACKING; SHIPBORNE.) (*ATMOSPHERE; SKY BRIGHTNESS; SOLAR ENERGY; BLACKBODY RADIATION; DENSITY; ABSORPTION; SCATTERING; *ATTENUATION; *WAVE TRANSMISSION; MEASUREMENT; OPTICAL ANALYSIS.) (ATMOSPHERE MODELS; INSTRUMENTATION.) *GUIDED MISSILE TRACKING SYSTEMS.
BARNES ENGINEERING CO., STAMFORD, CONN.
AD-273 612 62-2-6 DIV. 6

(*ATMOSPHERE; *CLOUDS; *AEROSOLS; GASES, CONDENSATION, NUCLEI; *PRECIPITATION; SEDIMENTATION; DIFFUSION; WASH-OUT.) GERMANY, JOHANN WOLFGANG GOETHE U. (GERMANY).
AD-273 765 62-2-6 DIV. 2

(RECOMBINATION REACTIONS AND DIFFUSION; DENSITY, TEMPERATURE AND BAROMETRIC PRESSURE OF ATOMIC NITROGEN AND ATOMIC OXYGEN.) (*ATMOSPHERE; HOMOSPHERE; HETEROSPHERE AND THERMOSPHERE.) *ATMOSPHERE MODELS.
IONOSPHERE RESEARCH LAB., PENNSYLVANIA STATE U., UNIVERSITY PARK.
AD-273 838 62-2-6 DIV. 2

***ATMOSPHERE MODELS**

(RECOMBINATION REACTIONS AND DIFFUSION; DENSITY, TEMPERATURE AND BAROMETRIC PRESSURE OF ATOMIC NITROGEN AND ATOMIC OXYGEN.) (*ATMOSPHERE; HOMOSPHERE; HETEROSPHERE AND THERMOSPHERE.) *ATMOSPHERE MODELS.

IONOSPHERE RESEARCH LAB., PENNSYLVANIA STATE U., UNIVERSITY PARK.
AD-273 838 62-2-6 DIV. 2

*ATMOSPHERICS

(WAVE TRANSMISSION OF *VERY LOW FREQUENCY, ENERGY BETWEEN EARTH AND *IONOSPHERE, *ATMOSPHERICS.) (*RADIO RANGES AND *AZIMUTH OF RADIOFREQUENCY OSCILLATIONS, RADIOFREQUENCY SPECTRUM ANALYZERS.) (WAVEGUIDES, ANTENNAS, RADIO RECEIVERS, OSCILLOSCOPES, DELAY LINES, RADIOFREQUENCY APPLIFIERS.) (ERRORS, MATHEMATICAL PREDICTION.)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 784 62-2-6 DIV. 25

*ATOMIC BOMB EXPLOSIONS

(HIGH ALTITUDE, *ATOMIC BOMB EXPLOSIONS.) (FISSION PRODUCTS, IONIZATION, *RECOMBINATION REACTIONS.) (PLASMA PHYSICS, RECOMBINATION REACTIONS.) HYDROGEN.
GEOPHYSICS CORP. OF AMERICA, BOSTON, MASS.
AD-273 698 2-2-6 DIV. 20

*ATTENTION

(*ATTENTION, VISUAL SIGNALS, DETECTION.) (FATIGUE (PHYSIOLOGY), TIME.)
ENGINEERING PSYCHOLOGY LAB., U. OF PITTSBURGH, PA.
AD-273 574 62-2-6 DIV. 28

*ATTENUATION

(RE-ENTRY VEHICLES, *OPTICAL TRACKING, *INFRARED TRACKING, SHIPBORNE.) (*ATMOSPHERE, SKY BRIGHTNESS, SOLAR ENERGY, BLACKBODY RADIATION, DENSITY, ABSORPTION, SCATTERING, *ATTENUATION, *WAVE TRANSMISSION, MEASUREMENT, OPTICAL ANALYSIS.) (ATMOSPHERE MODELS, INSTRUMENTATION.) *GUIDED MISSILE TRACKING SYSTEMS.
BARNES ENGINEERING CO., STAMFORD, CONN.
AD-273 612 62-2-6 DIV. 6

*AURORAE

(*MOON, RADIO SIGNALS, VERY HIGH FREQUENCY, RADIOFREQUENCY SPECTRUM ANALYZERS, ELECTROMAGNETIC WAVES, REFLECTION, *EXTRATERRESTRIAL RADIO WAVES, *RADIO ASTRONOMY, *AURORAE.) (*ECHO RANGING, DOPPLER SYSTEMS, PARABOLIC ANTENNAS, *IONOSPHERE, POLARIZATION.) (INSTRUMENTATION, OSCILLATORS, OSCILLATOR CIRCUITS, PARAMETRIC AMPLIFIER, RECORDING DEVICES.)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 686 62-2-6 DIV. 2

(*RADIO WAVES, HIGH FREQUENCY, VERY HIGH FREQUENCY, *RADIO TRANSMISSION, ABSORPTION, ATTENUATION, PROPAGATION, IONOSPHERIC PROPAGATION.) (*AURORAE, IONOSPHERE, ARCTIC REGIONS, RADIO COMMUNICATION SYSTEMS, RELIABILITY, ERRORS.)
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 778 62-2-6 DIV. 5

*AUXILIARY POWER PLANTS

(*LUNAR PROBES, MOBILE, *POWER SUPPLIES, *AUXILIARY POWER PLANTS.) (SOLAR CELLS OF SILICON, THERMOELECTRICITY, NUCLEAR POWER PLANTS, ELECTRIC POWER PRODUCTION, STORAGE BATTERIES, PRIMARY BATTERIES, ELECTROCHEMISTRY, THERMIONIC EMISSION.) (MOON, SURFACE PROPERTIES, SPACE ENVIRONMENTAL CONDITIONS, EXPLORATION.)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 811 62-2-6 DIV. 12

*AVIATION ACCIDENTS

(*AVIATION ACCIDENTS, AVIATION SAFETY, ANALYSIS, COUNTERMEASURES.) (PILOTS, HUMAN ENGINEERING, VISION, VISUAL THRESHOLDS, ATMOSPHERE.) (AIRPLANES, DETECTION, *AIRCRAFT FINISHES, VISIBILITY, THEORY, ANALYSIS, TESTS.) (FLUORESCENCE, PAINTS, PHYSICAL PROPERTIES, OPTICS.) (*AIRCRAFT MARKINGS, DESIGN, COSTS, MAINTENANCE, MILITARY REQUIREMENTS, LIFE EXPECTANCY.)
APPLIED PSYCHOLOGY CORP., ARLINGTON, VA.
AD-273 691 2-2-6 DIV. 1

(*AVIATION SAFETY, *AVIATION ACCIDENTS, COUNTERMEASURES, AIRCRAFT EQUIPMENT, ELECTRONIC EQUIPMENT, RADIO EQUIPMENT, *RADAR BEACONS, DESIGN, ELECTRONIC CIRCUITS.) (RADIO TRANSMITTERS, DISCRIMINATORS, POWER SUPPLIES, RADIO RECEIVERS, DATA PROCESSING SYSTEMS, DISPLAY SYSTEMS, ELECTRONIC CIRCUITS, DESIGN.) PROGRAMMING, CODING.
MOTOROLA, INC., RIVERSIDE, CALIF.
AD-273 831 62-2-6 DIV. 1

*AVIATION PERSONNEL

(*MEDICAL RESEARCH, *OXYGEN CONSUMPTION, *AVIATION PERSONNEL.) (ALTITUDE CHAMBERS, LOW PRESSURE RESEARCH, NAVAL PERSONNEL, DIET, METABOLISM, SLEEP, BLOOD, METABOLIC PRODUCTS, SIMULATION.)
NAVAL MISSILE AND ASTRONAUTICS CENTER, POINT MUGU, CALIF.
AD-273 863 62-2-6 DIV. 16

*AVIATION SAFETY

(DESIGN OF *JETTISONABLE COCKPITS, EJECTION SEATS FOR SUPERSONIC PLANES.) (*MODEL TESTS ON TRACKS (AERODYNAMICS), *WIND TUNNEL MODELS.) (AERODYNAMIC CONFIGURATIONS, PRESSURE CAPSULES, HUMAN ENGINEERING, PARACHUTE DESCENTS, STABILIZATION SYSTEMS, RECOVERY, SEA RESCUES, *AVIATION SAFETY.) (TESTS, LIFT, DRAG, PITCH, MOMENTS, YAW, STABILITY, DATA, TABLES.) (EFFECTIVENESS OF TOWED BODIES WITH PNEUMATIC DEVICES FOR STABILIZATION.)
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 626 62-2-6 DIV. 1

(*AVIATION SAFETY, *AVIATION ACCIDENTS, COUNTERMEASURES, AIRCRAFT EQUIPMENT, ELECTRONIC EQUIPMENT, RADIO EQUIPMENT, *RADAR BEACONS, DESIGN, ELECTRONIC CIRCUITS.) (RADIO TRANSMITTERS, DISCRIMINATORS, POWER SUPPLIES, RADIO RECEIVERS, DATA PROCESSING SYSTEMS, DISPLAY SYSTEMS, ELECTRONIC CIRCUITS, DESIGN.) PROGRAMMING, CODING.
MOTOROLA, INC., RIVERSIDE, CALIF.
AD-273 831 62-2-6 DIV. 1

*AZIMUTH

(WAVE TRANSMISSION OF *VERY LOW FREQUENCY, ENERGY BETWEEN EARTH AND *IONOSPHERE, *ATMOSPHERICS.) (*RADIO RANGES AND *AZIMUTH OF RADIOFREQUENCY OSCILLATIONS, RADIOFREQUENCY SPECTRUM ANALYZERS.) (WAVEGUIDES, ANTENNAS, RADIO RECEIVERS, OSCILLOSCOPES, DELAY LINES, RADIOFREQUENCY APPLIFIERS.) (ERRORS, MATHEMATICAL PREDICTION.)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 784 62-2-6 DIV. 25

*BALANCES

(*WIND TUNNELS, INSTRUMENTATION, *BALANCES BY MAGNETIC FIELDS, DESIGN, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS, VECTOR ANALYSIS, CALIBRATION.) (SPHERES, DRAG, MODEL TESTS, WIND TUNNEL MODELS.)
RESEARCH LABS. FOR THE ENGINEERING SCIENCES, U. OF VIRGINIA, CHARLOTTESVILLE.
AD-273 655 62-2-6 DIV. 30

*BALLISTIC CAMERAS

(*SATELLITE VEHICLES, COMMUNICATION SYSTEMS, BALLOONS, CALIBRATION, TESTS OF RADIO INTERFEROMETERS, TRACKING AND OPTICAL TRACKING WITH *BALLISTIC CAMERAS, MATHEMATICAL ANALYSIS OF ERRORS, SATELLITE VEHICLE TRAJECTORIES.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 630 62-2-6 DIV. 12

*BARBED WIRE

(DESIGN AND OPERATION OF *SMALL ARMS, *GUNS USED IN FIRING *BARBED WIRE FOR CONTROL OF PERSONNEL.) WIRE, CONTAINERS, PACKAGING.
FRANKFORD ARSENAL, PHILADELPHIA, PA.
AD-273 834 62-2-6 DIV. 22

*BEARINGS

(*BEARINGS, SPACE ENVIRONMENTAL CONDITIONS, LIQUID METALS, POTASSIUM, LUBRICANTS, VISCOSITY, DESIGN.) (TEST EQUIPMENT, DESIGN.)
GENERAL ELECTRIC CO., CINCINNATI, OHIO.
AD-273 859 62-2-6 DIV. 26

*BEHAVIOR

(*PILOTS, *BEHAVIOR, MEASUREMENT, FLIGHT INSTRUMENTS, CONTROL SYSTEMS, COCKPITS.) (DYNAMICS, MOTOR REACTIONS, REACTION (PSYCHOLOGY).) MATHEMATICAL COMPUTER DATA.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 668 62-2-6 DIV. 28

(*CLOSED CYCLE ECOLOGICAL SYSTEMS, MAN, CONFINEMENT.) (*BEHAVIOR, STRESS (PHYSIOLOGY), STRESS (PSYCHOLOGY).) (FEASIBILITY STUDIES, SIMULATION.)
LOCKHEED AIRCRAFT CORP., MARIETTA, GA.
AD-273 511 62-2-6 DIV. 16

*BERYLLIUM

(*BERYLLIUM, PREPARATION, PURIFICATION BY ZONE MELTING, CRYSTALLIZATION, SINGLE CRYSTALS, METALLIC CRYSTALS AND VAPORIZATION OF IMPURITIES.) (CRYSTALS, TENSILE PROPERTIES, DEFORMATION, MECHANICAL PROPERTIES, HARDENING, SHEAR STRESSES, FRACTURE (MECHANICS).)
ELECTRON MICROSCOPY, SPARK MACHINING.
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
AD-273 621 62-2-6 DIV. 17

(METALS, *SHEETS, *BERYLLIUM, MANUFACTURING METHODS, PROCESSING.) (TESTS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, ELASTICITY, DEFORMATION, STRESSES.) (ALLOYS, STAINLESS STEEL (PH15-7MO+RH950), TITANIUM ALLOYS (TI6AL-4V).)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 707 2-2-6 DIV. 17

*BERYLLIUM COMPOUNDS

(THERMODYNAMICS, *SOLID ROCKET PROPELLANTS, COMBUSTION, COMBUSTION CHAMBER GASES.) (VAPORIZATION, VAPOR PRESSURE OF *BORON COMPOUNDS, OXIDES, *LITHIUM COMPOUNDS, OXIDES, LITHIUM COMPOUNDS, BORATES, *BERYLLIUM COMPOUNDS, FLUORIDES.) (SPECIFIC HEAT, MEASUREMENT, TEST METHODS, TANTALUM, TESTS.) (MASS SPECTROSCOPY OF BORON COMPOUNDS, OXIDES, MAGNESIUM COMPOUNDS, FLUORIDES, IONIZATION.) (DATA, TABLES.)
AERONUTRONIC, NEWPORT BEACH, CALIF.
AD-273 792 62-2-6 DIV. 10

*BIBLIOGRAPHY

(*CELESTIAL MECHANICS, GEODESICS, *GEODETIC ASTRONOMY.) (*INERTIAL NAVIGATION, ORBITAL FLIGHT PATHS, SATELLITE VEHICLES, ROCKETS, SOUNDING ROCKETS.) (EARTH, GRAVITY, RELATIVITY THEORY.) (TERRAIN, GEOPHYSICS, *GEODETIC DATA, GEOMETRY.) (COMPUTERS, ERRORS, ANALYSIS.) (TRANSFORMATIONS (MATHEMATICS), TAYLOR'S SERIES, FOURIER ANALYSIS, INTEGRAL EQUATIONS.) *BIBLIOGRAPHY.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 499 62-2-6 DIV. 2

(*SEMICONDUCTORS, *DIODES, *MODULATORS, DETECTORS, CIRCUITS, DESIGN, TRANSISTORS, *ELECTRONIC CIRCUITS, HIGH FREQUENCY, VERY HIGH FREQUENCY, THEORY, OPERATION, MEASUREMENT, MATHEMATICAL ANALYSIS, *BIBLIOGRAPHY.)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 510 62-2-6 DIV. 8

(*SYMPOSIA, *BIBLIOGRAPHY, *SHOCK, *VIBRATION, *ACOUSTIC IMPEDANCE.) (VIBRATION ISOLATORS, MECHANICAL PROPERTIES, RESISTANCE TO MOTION, DYNAMICS, DAMPING, EFFECTIVENESS.) (ACOUSTIC IMPEDANCE, MEASUREMENT, INSTRUMENTATION, TRANSDUCERS, CALIBRATION, SENSITIVITY, MATHEMATICAL ANALYSIS.)
ASSISTANT SECRETARY OF DEFENSE (RESEARCH AND ENGINEERING), WASHINGTON, D. C.
AD-273 514 62-2-6 DIV. 25

(*BIBLIOGRAPHY, *RADIATION EFFECTS, RADIATION DAMAGE, ELECTRONICS, POLYMERS, METALS, ORGANIC COMPOUNDS, INORGANIC SUBSTANCES, DOSIMETERS.)
RADIATION EFFECTS INFORMATION CENTER, COLUMBUS, OHIO.
AD-273 536 62-2-6 DIV. 20

PRINTED CIRCUITS, *MINIATURE CAMERAS, *MINIATURE ELECTRICAL EQUIPMENT, *MINIATURE ELECTRON TUBES, *MINIATURE ELECTRONIC EQUIPMENT, *MINIATURE FUZES, *SUBMINIATURE ELECTRICAL EQUIPMENT, *SUBMINIATURE ELECTRON TUBES, *SUBMINIATURE ELECTRONIC EQUIPMENT, PACKAGED CIRCUITS, *BIBLIOGRAPHY.
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
AD-273 600 62-2-6 DIV. 8,

(*BIBLIOGRAPHY, *MEMORY,) *LEARNING.
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 640 62-2-6 DIV. 28

(*BIBLIOGRAPHY, *ANTISUBMARINE WARFARE, *SUBMARINES, *TORPEDOES, *OCEANOGRAPHY.) (UNDERSEA WARFARE, CONTROL SYSTEMS, NUCLEAR PROPULSION, SUBMARINE PERISCOPES, SUBMARINE NOISE.)
AUTONETICS, DOWNEY, CALIF.
AD-273 660 62-2-6 DIV. 31

(*BIBLIOGRAPHY, *POWER SUPPLIES, INDEXES, AUXILIARY POWER PLANTS, ALKALINE CELLS, DRY CELLS, GUIDED MISSILE BATTERIES, FUEL CELLS, STORAGE BATTERIES, SOLAR CELLS, SOLAR ENERGY, MAGNETOHYDRODYNAMICS, GENERATORS, THERMOELECTRICITY, SPACESHIPS, THERMIONIC EMISSION, THERMOPILES, LUBRICANTS, GREASES, HIGH TEMPERATURE RESEARCH.) (GAS GENERATING SYSTEMS, SERVO SYSTEMS,) (TITANIUM ALLOYS, ROLLING MILLS,) (STEEL, EXTRUSION, MECHANICAL PROPERTIES.) (AIRFRAMES, STAINLESS STEEL.) (TITANIUM TUBING, NIOBIUM ALLOYS, BERYLLIUM.) (REFRACTORY COATINGS, PLASTICS, REINFORCING MATERIALS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 676 62-2-6 DIV. 7

(*BIBLIOGRAPHY, *POWER SUPPLIES, INDEXES, AUXILIARY POWER PLANTS, ALKALINE CELLS, DRY CELLS, GUIDED MISSILE BATTERIES, FUEL CELLS, STORAGE BATTERIES, MAGNETOHYDRODYNAMICS, GENERATORS, THERMOELECTRICITY, SPACESHIPS, SOLAR CELLS, SOLAR ENERGY, THERMI-

GAIC EMISSION; THERMOPILES; LUBRICANTS; HIGH TEMPERATURE RESEARCH; GREASES.) (GAS GENERATING SYSTEMS; SERVO SYSTEMS.) (TITANIUM ALLOYS; ROLLING MILLS.) (STEEL; EXTRUSION; MECHANICAL PROPERTIES.) (AIRFRAMES; STAINLESS STEEL.) (TITANIUM TUBING; NIOBIUM ALLOYS; BERYLLIUM.) (REFRACTORY COATINGS; PLASTICS; REINFORCING MATERIALS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 677 62-2-6 DIV. 7

(*BIBLIOGRAPHY; *POWER SUPPLIES; INDEXES; AUXILIARY POWER PLANTS; ALKALINE CELLS; DRY CELLS; GUIDED MISSILE BATTERIES; FUEL CELLS; STORAGE BATTERIES; MAGNETOHYDRODYNAMICS; GENERATORS; SPACESHIPS; SOLAR CELLS; SOLAR ENERGY; THERMIONIC EMISSION; THERMOELECTRICITY; THERMOPILES; LUBRICANTS; HIGH TEMPERATURE RESEARCH; GREASES.) (GAS GENERATING SYSTEMS; SERVO SYSTEMS.) (TITANIUM ALLOYS; ROLLING MILLS.) (STEEL; EXTRUSION; MECHANICAL PROPERTIES.) (AIRFRAMES; STAINLESS STEEL.) (TITANIUM TUBING; NIOBIUM ALLOYS; BERYLLIUM.) (PLASTICS; REINFORCING MATERIALS.) REFRACTORY COATINGS.
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 678 62-2-6 DIV. 7

(*BIBLIOGRAPHY; *POWER SUPPLIES; INDEXES; AUXILIARY POWER PLANTS; ALKALINE CELLS; DRY CELLS; GUIDED MISSILE BATTERIES; FUEL CELLS; STORAGE BATTERIES; MAGNETOHYDRODYNAMICS; GENERATORS; SPACESHIPS; SOLAR CELLS; SOLAR ENERGY; THERMIONIC EMISSION; THERMOELECTRICITY; THERMOPILES; LUBRICANTS; HIGH TEMPERATURE RESEARCH; GREASES.) (GAS GENERATING SYSTEMS; SERVO SYSTEMS.) (TITANIUM ALLOYS; ROLLING MILLS.) (STEEL; EXTRUSION; MECHANICAL PROPERTIES.) (AIRFRAMES; STAINLESS STEEL.) (TITANIUM TUBING; NIOBIUM ALLOYS; BERYLLIUM.) (REFRACTORY COATINGS; PLASTICS; REINFORCING MATERIALS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 679 62-2-6 DIV. 7

(*BIBLIOGRAPHY; *MINERALS; *METALS.) (COBALT; COPPER; LEAD; IRON; MANGANESE; MERCURY; NICKEL; SILVER; ZINC; ANTIMONY; ARSENIC; BISMUTH; SELENIUM; SULFUR; TELLURIUM.)
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
AD-273 703 2-2-6 DIV. 17

(*ORGANIC MATERIALS; *SEMICONDUCTORS; *ORGANIC COMPOUNDS; POLYMERS; CONDUCTIVITY; ELECTRICAL PROPERTIES; THEORY; SOLID STATE PHYSICS.) BENZENES; *BIBLIOGRAPHY.
PLASTICS LAB., PRINCETON U., N. J.
AD-273 720 2-2-6 DIV. 14

(*BIBLIOGRAPHY OF *SCIENTIFIC PERSONNEL ACTIVE IN USSR; MASER; *SCIENTIFIC RESEARCH.) QUANTUM MECHANICS; RADIO WAVES; PHYSICS.) SEMICONDUCTORS; ORGANIC MATERIALS.
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 834 62-2-6 DIV. 25

***BLACKBODY RADIATION**

HANDBOOKS OF *BLACKBODY RADIATION; *FUNCTIONS; *TABLES.
NAVAL ORDNANCE TEST STATION; CHINA LAKE, CALIF.
AD-273 599 62-2-6 DIV. 25

***BLAST**

(*WAVE TRANSMISSION; *STRESSES; *BLAST (LOADING); *DEFORMATION; ELASTICITY; PLASTICITY; MECHANICS.) (DISLOCATIONS OF *CRYSTAL STRUCTURE; LATTICES IN SOLIDS; *RODS; *STRUCTURAL SHELLS; ELASTIC SHELLS.) (POTENTIAL THEORY; PARTIAL DIFFERENTIAL EQUATIONS; HARMONIC ANALYSIS; FOURIER ANALYSIS.) CONTINUUM MECHANICS; LOAD DISTRIBUTION.
AMERICAN MACHINE AND FOUNDRY CO., NILES, ILL.
AD-273 834 62-2-6 DIV. 25

(LAUNCHING OF SHIPBORNE; SURFACE TO AIR; *GUIDED MISSILES FROM *CRUISERS.) (MEASUREMENT OF EXPLOSION DAMAGE FROM BOOSTER ROCKETS; LAUNCHING TO SHIP BULKHEADS; SHIP DECKS; PERSONNEL.) (GUIDED MISSILE PERSONNEL; *HAZARDS; *BLAST; BOOSTER ROCKETS.) (MEASUREMENT OF POISONOUS GASES; EXHAUST GASES; EXHAUST FLAMES; NOISE FROM BOOSTER ROCKETS.) *NAVAL VESSELS.
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 779 62-2-6 DIV. 12

***BLUNT BODIES**

(*RE-ENTRY VEHICLES; *BLUNT BODIES; AERODYNAMIC HEATING; *RE-ENTRY AERODYNAMICS; AERODYNAMICS; HYPERSONICS; GAS IONIZATION; SHOCK WAVES; THERMAL RADIATION; *INFRARED RADIATION; MATHEMATICAL ANALYSIS; MEASUREMENT.) (NITROGEN; AIR; HEATING; INFRARED RADIATION.)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 865 62-2-6 DIV. 9

***BODY ARMOR**

(*SYMPOSIA; *BODY ARMOR; PROTECTIVE CLOTHING.) TEXTILES; LAMINATES; PHYSICAL PROPERTIES; SHOCK RESISTANCE.
OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 876 62-2-6 DIV. 29

***BONDING**

(*HANDBOOKS; *LAMINATES; *PLASTICS; POLYMERS; ESTERS; REINFORCING MATERIALS; GLASS; *BONDING; ADHESIVES; RESIN ADHESIVES; *JOINTS, BOLTS, RIVETS; METAL SCREWS.) (LAMINATES; MECHANICAL PROPERTIES; TENSILE PROPERTIES; THICKNESS.) *INSTRUCTION MANUALS.
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
AD-273 561 62-2-6 DIV. 14

***BOOSTER ROCKETS**

(*BOOSTER ROCKETS; LAUNCHING; NOISE; *ACOUSTICS; MEASUREMENT; FREQUENCY.) (*SOUND; VIBRATION; PRESSURE.)
AEROSPACE MEDICAL DIV., *WRIGHT AIR DEVELOPMENT DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 666 62-2-6 DIV. 27

***BORIDES**

(*SILICON COMPOUNDS; *METALLIC COMPOUNDS; *BORIDES; CARBIDES; NITRIDES; POWDER METALS; CRYSTAL STRUCTURE; PHYSICAL PROPERTIES; DENSITY; CHEMICAL PROPERTIES; HEAT OF FORMATION; SINTERING; HYDRAULIC PRESSES.) (SILICON COMPOUNDS; TITANIUM COMPOUNDS; CHROMIUM COMPOUNDS; BORIDES.) REFRACTORY MATERIALS; USSR.
METALS AND CERAMICS LAB., AERONAUTICAL SYSTEMS DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 601 62-2-6 DIV. 4

***BOROHYDRIDES**

(*BOROHYDRIDES; *ORGANOBORANES; *PENTABORANES; DEUTERATED COMPOUNDS; SYNTHESIS; NUCLEAR MAGNETIC RESONANCE; MOLECULAR STRUCTURE.) (PENTABORANES; CHEMICAL REACTIONS; BUTENES; PENTENES; CATALYSTS; METHYL RADICALS; PYRIDINES.)
LOS ANGELES STATE COLL., CALIF.
AD-273 469 62-2-6 DIV. 4

***BORON**

(*BORON; *COMBUSTION; CHEMICAL REACTIONS; FLUORINE; *OXIDIZERS; OXIDATION; REACTION KINETICS; *BORON COMPOUNDS; FLUORIDES; MASS SPECTROSCOPY; TEMPERATURE; HIGH TEMPERATURE RESEARCH.)
TEXACO EXPERIMENT INC., RICHMOND, VA.
AD-273 733 2-2-6 DIV. 4

***BORON COMPOUNDS**

(THERMODYNAMICS; *SOLID ROCKET PROPELLANTS; COMBUSTION; COMBUSTION CHAMBER GASES.) (VAPORIZATION; VAPOR PRESSURE OF *BORON COMPOUNDS; OXIDES; *LITHIUM COMPOUNDS; OXIDES; LITHIUM COMPOUNDS; BORATES; *BERYLLIUM COMPOUNDS; FLUORIDES.) (SPECIFIC HEAT; MEASUREMENT; TEST METHODS; TANTALUM; TESTS.) (MASS SPECTROSCOPY OF BORON COMPOUNDS; OXIDES; MAGNESIUM COMPOUNDS; FLUORIDES; IONIZATION.) (DATA; TABLES.)
AERONUTRONIC, NEWPORT BEACH, CALIF.
AD-273 792 62-2-6 DIV. 10

***BRAZING**

(*SANDWICH PANELS; MANUFACTURING METHODS; DESIGN; *BRAZING; HONEYCOMB CORES; REFRACTORY MATERIALS; METALS; *MOLYBDENUM ALLOYS; *NIOBIUM ALLOYS; TITANIUM ALLOYS; ZIRCONIUM ALLOYS.) (REFRACTORY COATINGS; SANDWICH CONSTRUCTION; OXIDATION INHIBITORS; HEAT SHIELDING; SPACESHIPS; SATELLITE VEHICLES; THERMAL INSULATION.) (HIGH TEMPERATURE RESEARCH; SOLDERING ALLOYS; VACUUM FURNACES; TESTS; TEST EQUIPMENT; TOOLS.) (HONEYCOMB CORES; ELECTRON BEAMS; WELDING.) (SHEETS; FOILS; PROCESSING; MECHANICAL PROPERTIES.)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 850 62-2-6 DIV. 26

***BUCKLING**

(*STRUCTURES; *STRUCTURAL SHELLS; DEFORMATION; *BUCKLING; FAILURE (MECHANICS).) (*STRESSES; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS.)
BROWN U., PROVIDENCE, R. I.
AD-273 797 62-2-6 DIV. 25

***CADMIUM COMPOUNDS**

(*SEMICONDUCTORS, INTERMETALLIC COMPOUNDS, *SINGLE CRYSTALS, *CADMIUM COMPOUNDS, *TELLURIDES, PHASE STUDIES, MELTING, GROWTH, ZONE MELTING, TEMPERATURE, ELECTRON OPTICS, REFLECTION, ABSORPTION, SPECTROGRAPHIC ANALYSIS, SOLID STATE PHYSICS,)
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
AD-273 623 62-2-6 DIV. 25

***CALCIUM COMPOUNDS**

(SINTERED, *ZIRCONIUM COMPOUNDS, *DIOXIDES, *CALCIUM COMPOUNDS, *ZIRCONATES, YTTRIUM COMPOUNDS, OXIDES, CERIUM COMPOUNDS, REFRACTORY MATERIALS, CERAMIC MATERIALS, HIGH TEMPERATURE RESEARCH,) (TEST METHODS, *THERMODYNAMICS, THERMAL STRESSES, THERMAL EXPANSION, THERMAL CONDUCTIVITY, BLACK-BODY RADIATION, SPECIFIC HEAT, MELTING, CRYSTAL STRUCTURE, DENSITY, POROSITY,) TABLES, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES,
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 802 62-2-6 DIV. 14

***CALIBRATION**

(*PHOTOTHEODOLITES, *CALIBRATION, ERRORS, STANDARDS,) (COLLIMATORS, *PHOTOGRAPHIC EQUIPMENT, INSTRUMENTATION, AZIMUTH, RECORDING DEVICES, MEASUREMENT,) (TRIGONOMETRY, LEAST SQUARES METHOD, HARMONIC ANALYSIS, TRANSFORMATIONS, MATRIX ALGEBRA,)
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
AD-273 635 62-2-6 DIV. 24

***CAMERA TUBES**

(ANALYSIS OF *ELECTRON BEAMS, *CAMERA TUBES OF *RADIO SIGNALS, CYLINDRICAL BODIES, DESIGN,) (*RADIOFREQUENCY POWER, MICROWAVE EQUIPMENT, CAVITY RESONATORS, RESONANCE, ELECTROMAGNETIC WAVES, OSCILLATION,) (MOTION OF ELECTRONS, BESSEL FUNCTIONS, TAYLOR'S SERIES, DIFFERENTIAL EQUATIONS,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 781 62-2-6 DIV. 8

(*ICONOSCOPES, TELEVISION CAMERAS, *CAMERA TUBES, *INFRARED IMAGE TUBES, *INFRARED TELEVISION SYSTEMS, *TELEVISION GUIDANCE, *AERIAL RECONNAISSANCE, AIRBORNE, EFFECTIVENESS, ANALYSIS,) (CAMERA TUBES, OPTICAL EQUIPMENT, INFRARED EQUIPMENT, SENSITIVITY, SIGNAL-TO-NOISE RATIO,) (SURFACE AREA, SURFACE TEMPERATURES, ILLUMINATION, BRIGHTNESS, INTENSITY, BLACKBODY RADIATION, MATHEMATICAL ANALYSIS,)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 814 62-2-6 DIV. 8

***CATHODES (ELECTRON TUBES)**

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRON BEAMS, TEST EQUIPMENT,) (*OXIDE CATHODES, *CATHODES (ELECTRON TUBES), *DIODES,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 806 62-2-6 DIV. 8

(*CATHODES (ELECTRON TUBES), *OXIDE CATHODES, SEMICONDUCTORS, COATINGS, BARIUM COMPOUNDS, OXIDES, THIN FILMS,) (THERMIONIC EMISSION, ULTRAVIOLET RADIATION, TESTS,) (ELECTRONS, NONLINEAR SYSTEMS, TANTALUM COMPOUNDS, OXIDES, ALUMINUM, ALUMINUM COMPOUNDS, MEASUREMENT,)
ELECTRON TUBE RESEARCH LAB., U. OF MINN., MINNEAPOLIS.
AD-273 875 62-2-6 DIV. 8

***CAVITATION**

(*PHOTOGRAPHIC ANALYSIS OF *CAVITATION OBTAINED FROM MODEL TESTS OF THE WATER EXIT OF *GUIDED MISSILES,) (LAUNCHING, GUIDED MISSILES, UNDERWATER TO SURFACE,)
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
AD-273 717 2-2-6 DIV. 22

***CAVITY RESONATORS**

(*PLASMA PHYSICS, MEASUREMENT BY *CAVITY RESONATORS, MICROWAVE EQUIPMENT, *RADIOFREQUENCY POWER, *MICROWAVE PROBES,) (FERRITES, MAGNETRONS, KLYSTRONS, OSCILLOGRAMS, FREQUENCY MODULATION, QUARTZ RESONATORS, WAVEGUIDES,) (ANALYSIS, PERTURBATION THEORY, ELECTRONS, DENSITY,)
RESEARCH LAB. OF ELECTRONICS, MASS. INST. OF TECH., CAMBRIDGE.
AD-273 830 62-2-6 DIV. 25

***CELESTIAL MECHANICS**

(*CELESTIAL MECHANICS, GEODESICS, *GEODETIC ASTRONOMY,) (*INERTIAL NAVIGATION, ORBITAL FLIGHT PATHS, SATELLITE VEHICLES, ROCKET SOUNDING ROCKETS,) (EARTH, GRAVITY, RELATIVITY THEORY,) (TERRAIN, GEOPHYSICS, *GEODETIC DATA, GEOMETRY,) (COMPUTERS, ERRORS, ANALYSIS,) (TRANSFORMATIONS (MATHEMATICS), TAYLOR'S SERIES, FOURIER ANALYSIS, INTEGRAL EQUATIONS,) *BIBLIOGRAPHY,
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 659 62-2-6 DIV. 2

(SATELLITE VEHICLES, SPACESHIPS, *ORBITAL FLIGHT PATHS, SEPARATION, TAKE-OFF, SPACE FLIGHT, *CELESTIAL MECHANICS, DYNAMICS, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, BESSEL FUNCTIONS, PERTURBATION THEORY,) (MOTION, EQUATIONS,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 679 62-2-6 DIV. 12

***CERAMIC MATERIALS**

(*CERAMIC MATERIALS, *SILICON COMPOUNDS, DIOXIDES, PROCESSING OF *FOAMED BY PRESSURE, CASTING AND IMPREGNATION WITH ALUMINUM COMPOUNDS, CHLORIDES, POROSITY, MECHANICAL PROPERTIES,) (*GUIDED MISSILE NOSES, MANUFACTURING METHODS,)
GEORGIA INST. OF TECH. ENGINEERING EXPERIMENT STATION, ATLANTA.
AD-273 895 62-2-6 DIV. 14

***CESIUM**

(ALKALI METALS, *RUBIDIUM, *CESIUM, VAPORS, THEORY, THERMODYNAMICS, TRANSPORT PROPERTIES, MATHEMATICAL ANALYSIS, RECOMBINATION REACTIONS,) (ENERGY, ENTHALPY, SPECIFIC HEAT,) GASES,
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 598 62-2-6 DIV. 6

(*SPECTROGRAPHIC ANALYSIS, *MOLECULAR SPECTROSCOPY, RARE GASES AND ELEMENTS,) (SPECTROGRAPHIC DATA, RECORDING DEVICES, *INTERFEROMETERS, TEMPERATURES, MEASUREMENT,) (*SODIUM AND *CESIUM, *CLOUDS IN THE *UPPER ATMOSPHERE,)
GEORGIA U., ATHENS.
AD-273 763 62-2-6 DIV. 25

***CHELATE COMPOUNDS**

(*STEREOCHEMISTRY, *X-RAY DIFFRACTION ANALYSIS, *POWDERS, *COMPLEX COMPOUNDS, *COMPLEX IONS, TRANSITION ELEMENTS, ARSINES, PYRIDINES, HALIDES, *CHELATE COMPOUNDS, CHROMIUM COMPOUNDS, MOLYBDENUM COMPOUNDS, TUNGSTEN COMPOUNDS, MOLECULAR STRUCTURE,)
UNIVERSITY COLL., LONDON (GT. BRIT.),
AD-273 694 62-2-6 DIV. 25

***CHEMICAL REACTIONS**

(*PLASMA JETS, RADIOFREQUENCY, DESIGN FOR USE IN SYNTHESIS OF CYANOGEN, HYDROCYANIC ACIDS, ACETYLENES AND NITROGEN COMPOUNDS, OXIDES, *CHEMICAL REACTIONS, REDUCTION OF ALUMINUM COMPOUNDS, OXIDES,)
RESEARCH INST., TEMPLE U., PHILADELPHIA, PA.
AD-273 799 62-2-6 DIV. 25

***CHEMICAL WARFARE AGENTS**

(*MUSTARD GAS, VAPORIZATION, EVAPORATION, PENETRATION, SURFACES, PAINTS, FILMS,) (*CHEMICAL WARFARE AGENTS, *DECONTAMINATION BY CLIMATIC FACTORS, ATMOSPHERE,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 637 62-2-6 DIV. 3

***CHLORIDES**

(*OXYFLUORIDES AND *CHLORIDES, SYNTHESIS FROM OXYFLUORIDES AND FLUORIDES OF CHLORINE COMPOUNDS, BROMINE COMPOUNDS, SULFUR COMPOUNDS, CHEMICAL REACTIONS,) (PHYSICAL PROPERTIES, CHEMICAL PROPERTIES, SOLUBILITY, STABILITY, TEMPERATURE, ELECTRICAL PROPERTIES, LOW TEMPERATURE RESEARCH, ULTRAVIOLET SPECTROSCOPY,) ELECTRIC DISCHARGES,
RESEARCH INST., TEMPLE U., PHILADELPHIA, PA.
AD-273 732 2-2-6 DIV. 6

***CHROMIUM PLATING**

(*PLATING, *CHROMIUM PLATING, *NICKEL PLATING WITHOUT ELECTRODES, *METAL COATINGS, DEPOSITS OF NICKEL ALLOYS, COBALT ALLOYS, CHROMIUM ALLOYS, IRON ALLOYS ON STEEL, MAGNESIUM, ALUMINUM BY CHEMICAL REACTIONS, REDUCTION,) (STANNATES, COATINGS ON MAGNESIUM,) ALLOYS, METALS,
ROCK ISLAND ARSENAL LAB., ILL.
AD-273 648 62-2-6 DIV. 36

***CIVIL AVIATION**

(*AIR TRAFFIC CONTROL SYSTEMS, *CIVIL AVIATION, *RADAR NAVIGATION, *RADAR BEACONS, AUTOMATIC, *RADAR TRACKING, RADAR SIGNALS, DATA PROCESSING SYSTEMS, CODING, DISPLAY SYSTEMS, EFFECTIVENESS, ANALYSIS,) (AERIAL TARGETS, FLIGHT PATHS, RADAR TRACKING, IDENTIFICATION SYSTEMS, POSITION FINDING, RELIABILITY,)
AIRBORNE INSTRUMENTS LAB., INC., DEER PARK, LONG ISLAND, N. Y.
AD-273 742 62-2-6 DIV. 6

***CLOSED-CYCLE ECOLOGICAL SYSTEMS**

(*CLOSED CYCLE ECOLOGICAL SYSTEMS, MAN, CONFINEMENT,) (*BEHAVIOR, *STRESS (PHYSIOLOGY), STRESS (PSYCHOLOGY),) (FEASIBILITY STUDIES, SIMULATION,)
LOCKHEED AIRCRAFT CORP., MARIETTA, GA.
AD-273 511 62-2-6 DIV. 16

(USSR, TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH,) (*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, LIFE EXPECTANCY, SPACE FLIGHT TO *MOON, MARS, VENUS, SUN,) (SPACESHIPS, DECELERATION, *RE-ENTRY AERODYNAMICS,) (*UPPER ATMOSPHERE, GEOPHYSICS, *IONOSPHERE,) (PHOTOGRAPHY OF MOON, VAN ALLEN RADIATION BELT,) (BIOLOGY, CONTROLLED ATMOSPHERES, *CLOSED-CYCLE ECOLOGICAL SYSTEMS, DOGS, MANNED, PILOTS, TRAINING, AVIATION SAFETY, GLOBAL FLIGHT,)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***CLOUDS**

(*SPECTROGRAPHIC ANALYSIS, *MOLECULAR SPECTROSCOPY, RARE GASES AND ELEMENTS,) (SPECTROGRAPHIC DATA, RECORDING DEVICES, *INTERFEROMETERS, TEMPERATURES, MEASUREMENT,) (*SODIUM AND *CESIUM, *CLOUDS IN THE *UPPER ATMOSPHERE,)
GEORGIA U., ATHENS.
AD-273 763 62-2-6 DIV. 25

***COATINGS**

(*MATERIALS FOR SPACESHIPS AND SATELLITE VEHICLES, *REFRACTORY MATERIALS, *ALLOYS, *COATINGS, METALLIC TEXTILES, SOLID ROCKET PROPELLANTS, *METALS, FOAMS, BERYLLIUM COMPOUNDS, OXIDES, OPTICS, ABLATION, *PLASTICS, *ELASTOMERS, ADHESIVES, FILAMENT WOUND CONSTRUCTION, CRYOGENICS, SHIELDING,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 876 62-2-6 DIV. 14

(*HEAT RESISTANT PAINTS, PREPARATION FROM METALLIC COMPOUNDS, ZINC COMPOUNDS, OXIDES, METHYL RADICALS, HYDROGEN COMPOUNDS, PHOSPHITES, ETHYL RADICALS, PHOSPHATES, PROCESSING, AGING,) (*COATINGS FOR *METALS, ORGANIC COATINGS, CERAMIC COATINGS, PHOSPHATE COATINGS, ZIRCONATES, TITANATES, STANNATES,) (TESTS, RESISTANCE, TEMPERATURE, WATER, WEATHERPROOFING, HARDNESS, BONDING, SURFACE PROPERTIES,)
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
AD-273 582 62-2-6 DIV. 14

(*HEAT RESISTANT PAINTS, PREPARATION FROM METALLIC COMPOUNDS, ZINC COMPOUNDS, OXIDES, METHYL RADICALS, HYDROGEN COMPOUNDS, PHOSPHITES, ETHYL RADICALS, PHOSPHATES,) (*COATINGS FOR *METALS, ORGANIC COATINGS, CERAMIC COATINGS, PHOSPHATE COATINGS, ZIRCONATES, TITANATES, STANNATES, TESTS, THICKNESS, HARDNESS, SURFACE PROPERTIES, BONDING, RESISTANCE, TEMPERATURE, WATER, WEATHERPROOFING,)
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
AD-273 583 62-2-6 DIV. 14

(*STEEL, *COATINGS, *PLASTIC COATINGS, RESINS, POLYMERS, FLUORIDES, ETHYLENES, SURFACES, SANDBLASTING, ADHESION, CORROSION INHIBITION, LUBRICATION, TESTS,)
NAVAL WEAPONS PLANT, WASHINGTON, D. C.
AD-273 714 2-2-6 DIV. 14

(*COATINGS, REFRACTORY COATINGS, *OXIDATION INHIBITORS, SILICON COATINGS, *NIOBIUM ALLOYS (D-14), ZIRCONIUM ALLOYS, SHEETS, TESTS,) (COATINGS OF SILICIDES, ALUMINUM AND ALLOYS,) HIGH TEMPERATURE RESEARCH, SPACESHIPS, RE-ENTRY VEHICLES, STRUCTURES, REFRACTORY MATERIALS,
THOMPSON RAMO WOOLDRIDGE, INC., CLEVELAND, OHIO
AD-273 746 62-2-6 DIV. 14

(MATERIALS, *PHYSICAL PROPERTIES, THERMODYNAMICS, CORROSION, MECHANICAL PROPERTIES, TEST METHODS,) (*ABLATION, *COATINGS, ELECTRIC INSULATION, *GLASS TEXTILES, GRAPHITE, LAMINATES, ENCAPSULATION, EMBEDDING SUBSTANCES, *ZIRCONIUM COMPOUNDS, DIOXIDES,) (*STAINLESS STEEL (PH13-7MO), HONEYCOMB CORES, SANDWICH PANELS,) (*TOOL STEEL (HOT PUNCH AND DIE, OLYMPIC FM DIE, SELECT B DIE, JET FORGE TOOL, VASCO 7152 TOOL, CK SPECIAL TOOL), DIES,)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 801 62-2-6 DIV. 14

***CODING**

(COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, *DIGITAL SYSTEMS, *LINEAR SYSTEMS, *CODING, SEQUENCES, COMPUTER LOGIC, TEST METHODS, TESTS, OPERATION,) (DIGITAL COMPUTERS, ERRORS, CORRECTIONS,)
MONTANA STATE COLL., BOZEMAN.
AD-273 741 62-2-6 DIV. 30

***COMBUSTION**

(*LIQUEFIED GASES, *OXYGEN, CHEMICAL REACTIONS WITH *TITANIUM, *COMBUSTION, PRESSURE,) (OXIDATION INHIBITORS, HYDROGEN COMPOUNDS, FLUORIDES GAS OR ARGON AND COATINGS OF PHOSPHATES OR VAPOR PLATING, ALUMINUM,)
LIQUID ROCKET PROPELLANTS, METALS,
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
AD-273 489 62-2-6 DIV. 10

(*BORON, *COMBUSTION, CHEMICAL REACTIONS, FLUORINE, *OXIDIZERS, OXIDATION, REACTION KINETICS, *BORON COMPOUNDS, FLUORIDES, MASS SPECTROSCOPY, TEMPERATURE, HIGH TEMPERATURE RESEARCH,)
TEXACO EXPERIMENT INC., RICHMOND, VA.
AD-273 733 2-2-6 DIV. 4

(*FUEL SPRAYS INTO *TURBULENT FLOW, *COMBUSTION OF BENZENES, JET MIXING FLOW, SPECTROGRAPHIC ANALYSIS, CHEMICAL ANALYSIS, MEASUREMENT,)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 886 62-2-6 DIV. 10

***COMMUNICATION EQUIPMENT**

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, DATA TRANSMISSION SYSTEMS, VOICE COMMUNICATION SYSTEMS, SECRET COMMUNICATION SYSTEMS, TELETYPE SYSTEMS, RADIO COMMUNICATION SYSTEMS, TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS,) (*COMMUNICATION EQUIPMENT, ELECTRONIC SWITCHES, *SWITCHING CIRCUITS, ANALOG SYSTEMS, DIGITAL SYSTEMS, TRANSMISSION,)
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 682 62-2-6 DIV. 5

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, *VOICE COMMUNICATION SYSTEMS, *TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS,) (*COMMUNICATION EQUIPMENT, MAINTENANCE, RELIABILITY, FACSIMILE TRANSMISSION,) (CODING, PULSE MODULATION, AUDITORY SIGNALS,) *PANEL BOARDS (ELECTRICITY),
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 683 62-2-6 DIV. 5

(*GUIDED MISSILES, SURFACE TO SURFACE, *COMMUNICATION SYSTEMS, *COMMUNICATION EQUIPMENT, INSTALLATION IN MILITARY FACILITIES, QUALITY CONTROL, SCHEDULING, GROUND SUPPORT EQUIPMENT,)
ITT KELLOGG, CHICAGO, ILL.
AD-273 700 2-2-6 DIV. 5

***COMMUNICATION SYSTEMS**

(ASTRONOMY, *SUN, *TRACKING BY *COMMUNICATION SYSTEMS, INTERFEROMETERS, *ELECTRICAL NETWORKS, ANTENNAS,) (SOLAR DISTURBANCES, SOLAR FLARES, SOLAR CORONA, NOISE (RADIO),) (INSTRUMENTATION, PREAMPLIFIERS, DETECTORS, BAND-PASS FILTERS, RECORDING DEVICES,)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 457 62-2-6 DIV. 2

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, DATA TRANSMISSION SYSTEMS, VOICE COMMUNICATION SYSTEMS, SECRET COMMUNICATION SYSTEMS, TELETYPE SYSTEMS, RADIO COMMUNICATION SYSTEMS, TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS,) (*COMMUNICATION EQUIPMENT, ELECTRONIC SWITCHES, *SWITCHING CIRCUITS, ANALOG SYSTEMS, DIGITAL SYSTEMS, TRANSMISSION,)
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 682 62-2-6 DIV. 5

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, *VOICE COMMUNICATION SYSTEMS, *TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS,) (*COMMUNICATION EQUIPMENT, MAINTENANCE, RELIABILITY, FACSIMILE TRANSMISSION,) (CODING, PULSE MODULATION, AUDITORY SIGNALS,) *PANEL BOARDS (ELECTRICITY),
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 683 62-2-6 DIV. 5

(*GUIDED MISSILES, SURFACE TO SURFACE, *COMMUNICATION SYSTEMS, *COMMUNICATION EQUIPMENT, INSTALLATION IN MILITARY FACILITIES, QUALITY CONTROL, SCHEDULING, GROUND SUPPORT EQUIPMENT,)
ITT KELLOGG, CHICAGO, ILL.
AD-273 700 2-2-6 DIV. 5

***COMMUNICATIONS THEORY**

(*OPERATIONS RESEARCH, *COMMUNICATIONS THEORY, MILITARY COMMUNICATIONS, EFFECTIVENESS, MEASUREMENT, ERRORS,) (MILITARY ORGANIZATIONS, LANGUAGE, INTELLIGIBILITY, CONTROL,)
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
AD-273 946 62-2-6 DIV. 5

***COMPLEX COMPOUNDS**

(*STEREOCHEMISTRY, *X-RAY DIFFRACTION ANALYSIS, *POWDERS, *COMPLEX COMPOUNDS, *COMPLEX IONS, TRANSITION ELEMENTS, ARSINES, PYRIDINES, HALIDES, *CHELATE COMPOUNDS, CHROMIUM COMPOUNDS, MOLYBDENUM COMPOUNDS, TUNGSTEN COMPOUNDS, MOLECULAR STRUCTURE,)
UNIVERSITY COLL., LONDON (GT. BRIT.),
AD-273 654 62-2-6 DIV. 25

***COMPLEX IONS**

(*STEREOCHEMISTRY, *X-RAY DIFFRACTION ANALYSIS, *POWDERS, *COMPLEX COMPOUNDS, *COMPLEX IONS, TRANSITION ELEMENTS, ARSINES, PYRIDINES, HALIDES, *CHELATE COMPOUNDS, CHROMIUM COMPOUNDS, MOLYBDENUM COMPOUNDS, TUNGSTEN COMPOUNDS, MOLECULAR STRUCTURE,)
UNIVERSITY COLL., LONDON (GT. BRIT.),
AD-273 654 62-2-6 DIV. 25

***COMPUTER LOGIC**

(PROGRAMMING, *COMPUTER LOGIC, CODING, *LANGUAGE, MACHINES,) SWITCHING CIRCUITS,
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 789 62-2-6 DIV. 30

(*INFORMATION THEORY, *MEMORY DEVICES, DATA STORAGE SYSTEMS, DATA TRANSMISSION SYSTEMS,) (MAGNETIC TAPE, COMPUTERS, *DATA PROCESSING SYSTEMS, SWITCHING CIRCUITS, *COMPUTER LOGIC, SEQUENCES, CODING, PROBABILITY,) (TIME INTERVAL COUNTERS, ERRORS, ANALYSIS,) THESES,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 785 62-2-6 DIV. 30

***COMPUTERS**

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, *COMPUTERS, MEMORY DEVICES, CIRCUITS, ANALOG-TO-DIGITAL CONVERTERS, DESIGN, MAGNETIC MATERIALS, FILMS,) (PSYCHOLOGY, *SPEECH, AUTOMATIC, SPEECH REPRESENTATION,) MATHEMATICAL ANALYSIS,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 308 62-2-6 DIV. 30

***CONDUCTIVITY**

(MEASUREMENT, *ELECTRICAL CONDUCTANCE OF AIR, IONIZATION DURING *RE-ENTRY AERODYNAMICS,) (*INSTRUMENTATION, DESIGN OF SHOCK WAVES, *CONDUCTIVITY, *METERS FOR SATELLITE VEHICLES,) (CALIBRATION AND FLIGHT TESTING UNDER *SPACE ENVIRONMENTAL CONDITIONS,) (MAGNETOHYDRODYNAMICS, EXPERIMENTAL DATA, RELIABILITY,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 478 62-2-6 DIV. 9

***CONTROL SYSTEMS**

(STABILITY OF *FEEDBACK *CONTROL SYSTEMS,) (FEEDBACK SIGNALS, PULSE MODULATION, NONLINEAR SYSTEMS,) (OSCILLATORS, WAVE ANALYSIS,) (DATA, SAMPLING, FEEDBACK,)
ELECTRONICS RESEARCH LAB., U. OF CALIF., BERKELEY.
AD-273 858 62-2-6 DIV. 8

***CORRELATION TECHNIQUES**

(*AERIAL PHOTOGRAPHY, *AERIAL RECONNAISSANCE, PHOTOGRAPHIC INTELLIGENCE, SURFACE TARGETS, IDENTIFICATION, DETECTION, TARGET RECOGNITION,) (*AERIAL PHOTOGRAPHS, DATA PROCESSING SYSTEMS, AUTOMATIC, *CORRELATION TECHNIQUES, PHOTOGRAPHIC ANALYSIS,)
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 818 62-2-6 DIV. 24

***COSMIC RAY TELESCOPES**

(INTENSITY OF *COSMIC RAYS IN ATMOSPHERE OVER GERMANY,) (*COSMIC RAY TELESCOPES, RADIATION COUNTERS, BALLOONS,)
MAX-PLANCK-INSTITUT FUER AERONOMIE (GERMANY),
AD-273 627 62-2-6 DIV. 20

***COSMIC RAYS**

(INTENSITY OF *COSMIC RAYS IN ATMOSPHERE OVER GERMANY,) (*COSMIC RAY TELESCOPES, RADIATION COUNTERS, BALLOONS,)
MAX-PLANCK-INSTITUT FUER AERONOMIE (GERMANY),
AD-273 627 62-2-6 DIV. 20

(*COSMIC RAYS, INELASTIC SCATTERING,) (PROTON SCATTERING OF *NUCLEONS IN NUCLEI, COSMIC RAYS,) MESONS,
SPACE TECHNOLOGY LABS., INC., LOS ANGELES, CALIF.
AD-273 651 62-2-6 DIV. 20

***COUPLED ANTENNAS**

(*RADIO WAVES, REFLECTION, DIFFRACTION, PROPAGATION, IONOSPHERE, PHASE MEASUREMENT, IONOSPHERIC PROPAGATION, DENSITY, ANALYSIS,) (*COUPLED ANTENNAS, LINEAR SYSTEMS, PHASE DETECTORS USING SEMICONDUCTORS, SWITCHING CIRCUITS, SWITCHES, PREAMPLIFIERS, INSTRUMENTATION,) DIGITAL RECORDING SYSTEMS, DIGITAL COMPUTERS,
IONOSPHERE RESEARCH LAB., PENNSYLVANIA STATE UNIVERSITY, PARK.
AD-273 721 2-2-6 DIV. 8

***COUPLINGS**

(ROCKET MOTORS, SOLID ROCKET PROPELLANTS, *ROCKET CASES, *COUPLINGS, RINGS, PREPARATION, PROCESSING, PRODUCTION, DRAWING (MACHINE PROCESSING), FORGING, EXPLOSIVE FORMING, WELDING, MACHINING, EFFECTIVENESS OF *INDUSTRIAL PRODUCTION, RESEARCH PROGRAM ADMINISTRATION,)
6593D TEST GROUP (CRV) AIR FORCE SYSTEMS COMMAND, EDWARDS AIR FORCE BASE, CALIF.
AD-273 796 62-2-6 DIV. 27

***CRATERING**

(TERMINAL BALLISTICS, *CRATERING, EFFECTS OF MYLAR, PLASTICS, COPPER AND ALUMINUM, *HYPERVELOCITY PROJECTILES AND DISC-SHAPED *PARTICLES ON LEAD, TARGETS,) (HYPERVELOCITY GUNS, INSTRUMENTATION FOR ACCELERATION OF PARTICLES,) HIGH-SPEED PHOTOGRAPHY, PHOTOGRAPHIC ANALYSIS, CAPACITORS,
TECHNICAL OPERATIONS, INC., BURLINGTON, MASS.
AD-273 493 62-2-6 DIV. 22

(*PENETRATION OF *PARTICLES INTO *SOLIDS, SOLID STATE PHYSICS,) (ENERGY WAVE TRANSMISSION, ELASTIC SCATTERING,) (PLASTICITY, DEFORMATION, ELASTICITY, *STRESSES, SHEAR STRESSES, *PHASE TRANSITIONS,) (HYDRODYNAMICS, JETS,) (*CRATERING AND IMPACT SHOCK OF METEORITES,)
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
AD-273 718 2-2-6 DIV. 25

***CRUISERS**

(LAUNCHING OF SHIPBORNE, SURFACE TO AIR, *GUIDED MISSILES FROM *CRUISERS,) (MEASUREMENT OF EXPLOSION DAMAGE FROM BOOSTER ROCKETS, LAUNCHING TO SHIP BULKHEADS, SHIP DECKS, PERSONNEL,) (GUIDED MISSILE PERSONNEL, *HAZARDS, *BLAST, BOOSTER ROCKETS,) (MEASUREMENT OF POISONOUS GASES, EXHAUST GASES, EXHAUST FLAMES, NOISE FROM BOOSTER ROCKETS,) *NAVAL VESSELS,
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 779 62-2-6 DIV. 12

***CRYOGENICS**

(*CRYOGENICS, MATHEMATICAL LOGIC, COMPUTERS, *DATA PROCESSING SYSTEMS, THIN FILMS,) (*SWITCHING CIRCUITS, ELECTRONIC CIRCUITS, SUPERCONDUCTORS, TRIGGER CIRCUITS,) (THERMAL CONDUCTIVITY, MEASUREMENT, MATERIALS,) (*MEMORY DEVICES, DESIGN,)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 735 2-2-6 DIV. 30

(*CRYOGENICS, *DATA PROCESSING SYSTEMS, THIN FILMS OF TIN AND INDIUM, CIRCUITS, SUPERCONDUCTORS,) (*SWITCHING CIRCUITS, *MEMORY DEVICES, MATERIALS, DESIGN, MATHEMATICAL LOGIC,)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 736 2-2-6 DIV. 30

(*CRYOGENICS, FEASIBILITY STUDIES, *INFRARED RADIATION, *SOLAR ENERGY, *REFRIGERANT CONDENSERS, SHIELDING, VACUUM SYSTEMS, NITROGEN,) (INSTRUMENTATION, MEASUREMENT, VACUUM PUMPS, DESIGN, IONIZATION, GAGES,) (HEAT TRANSFER, THERMAL DIFFUSION, ALUMINUM,)
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
AD-273 739 2-2-6 DIV. 25

***CRYSTAL RECTIFIERS**

(HIGH TEMPERATURE RESEARCH, SILICON COMPOUNDS, CARBIDES, *CRYSTAL RECTIFIERS, ELECTRONIC EQUIPMENT, GUIDED MISSILES, SATELLITE VEHICLES, SUPERSONIC PLANES,) (RECTIFIERS, *CRYSTALS, *PRODUCTION, *MANUFACTURING METHODS, ENCAPSULATION, SUBLIMATION, PYROLYSIS,)
WESTINGHOUSE ELECTRIC CORP., DAYTON, OHIO.
AD-273 589 62-2-6 DIV. 8

***CRYSTAL STRUCTURE**

(*WAVE TRANSMISSION, *STRESSES, *BLAST (LOADING), *DEFORMATION, ELASTICITY, PLASTICITY, MECHANICS,) (DISLOCATIONS OF *CRYSTAL STRUCTURE, LATTICES IN SOLIDS, *RODS, *STRUCTURAL SHELLS, ELASTIC SHELLS,) (POTENTIAL THEORY, PARTIAL DIFFERENTIAL EQUATIONS, HARMONIC ANALYSIS, FOURIER ANALYSIS,) CONTINUUM MECHANICS, LOAD DISTRIBUTION,
AMERICAN MACHINE AND FOUNDRY CO., NILES, ILL.
AD-273 534 62-2-6 DIV. 25

***CRYSTALS**

(HIGH TEMPERATURE RESEARCH, SILICON COMPOUNDS, CARBIDES, *CRYSTAL RECTIFIERS, ELECTRONIC EQUIPMENT, GUIDED MISSILES, SATELLITE VEHICLES, SUPERSONIC PLANES,) (RECTIFIERS, *CRYSTALS, *PRODUCTION, *MANUFACTURING METHODS, ENCAPSULATION, SUBLIMATION, PYROLYSIS,)
WESTINGHOUSE ELECTRIC CORP., DAYTON, OHIO.
AD-273 589 62-2-6 DIV. 8

***CYANO RADICALS**

(*ORGANIC COMPOUNDS, *SEMICONDUCTORS, POLYMERS, *SYNTHESIS, CHEMICAL REACTIONS, *QUINONES, *CYANO RADICALS, PHENYL RADICALS, METHANES, OXIMES, BENZONITRILES, BENZENES, ETHYLENES, HYDROXIDES,) (ELECTRICAL PROPERTIES, ELECTRICAL CONDUCTANCE, PHOTOELECTRIC EFFECT, RADIOFREQUENCY,)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 836 62-2-6 DIV. 4

***DAMPING**

(*GALVANOMETERS, *DAMPING OF VIBRATION,) (FREQUENCY OF VIBRATION, LINEAR SYSTEMS, TABLES, VIBRATION, FREQUENCY,)
DAVID TAYLOR MODEL BASIN, WASHINGTON, D. C.
AD-273 734 2-2-6 DIV. 7

***DATA**

(*DATA, *STANDARDS, SPECIFICATIONS, HANDBOOKS,) (*MILITARY EQUIPMENT, *AIR FORCE EQUIPMENT, *AIR FORCE SUPPLIES, STANDARDIZATION, MILITARY REQUIREMENTS, PRODUCTION, CONTROL, MANAGEMENT ENGINEERING,)
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 890 62-2-6 DIV. 26

***DATA PROCESSING SYSTEMS**

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, *COMPUTERS, MEMORY DEVICES, CIRCUITS, ANALOG-TO-DIGITAL CONVERTERS, DESIGN, MAGNETIC MATERIALS, FILMS,) (PSYCHOLOGY, *SPEECH, AUTOMATIC SPEECH REPRESENTATION,) MATHEMATICAL ANALYSIS,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON, MASS.
AD-273 908 62-2-6 DIV. 30

(*AIR TRAFFIC CONTROL SYSTEMS, *DATA PROCESSING SYSTEMS, *ANALOG COMPUTERS, PROGRAMMING, VIDEO NETWORKS, DISPLAY SYSTEMS, RADAR EQUIPMENT, CONTROL SYSTEMS, DESIGN,) (*AIR CONTROL CENTERS, AIRPORT RADAR SYSTEMS, AUTOMATIC, RADAR TRACKING, RADIO BEACONS, RADAR SIGNALS, VIDEO SIGNALS, COMPUTERS, ELECTRONIC CIRCUITS, ELECTRONIC EQUIPMENT, INSTRUMENTATION,)
TASKER INSTRUMENTS CORP., VAN NUYS, CALIF.
AD-273 945 62-2-6 DIV. 30

(*ANALOG-TO-DIGITAL CONVERTERS, *DIGITAL COMPUTERS, *DATA PROCESSING SYSTEMS, RECORDING DEVICES, CODING, PROGRAMMING, PUNCHED CARD METHODS, MAGNETIC TAPE,) (NECN, SWITCHING CIRCUITS, TRIGGERED GATES,)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 669 62-2-6 DIV. 30

(*SINGLE CRYSTALS, *X-RAY DIFFRACTION ANALYSIS, CRYSTAL STRUCTURE, GONIOMETERS,) (*DATA PROCESSING SYSTEMS, COMPUTERS, *PROGRAMMING, PUNCHED CARD METHODS,) (CAMERAS, PHOTOGRAPHS BY REFLECTION,) (ERRORS, ANALYSIS,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 719 2-2-6 DIV. 30

(*CRYOGENICS, MATHEMATICAL LOGIC, COMPUTERS, *DATA PROCESSING SYSTEMS, THIN FILMS,) (*SWITCHING CIRCUITS, ELECTRONIC CIRCUITS, SUPERCONDUCTORS, TRIGGER CIRCUITS,) (THERMAL CONDUCTIVITY, MEASUREMENT, MATERIALS,) (*MEMORY DEVICES, DESIGN,)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 738 2-2-6 DIV. 30

(*CRYOGENICS, *DATA PROCESSING SYSTEMS, THIN FILMS OF TIN AND INDIUM, CIRCUITS, SUPERCONDUCTORS,) (*SWITCHING CIRCUITS, *MEMORY DEVICES, MATERIALS, DESIGN, MATHEMATICAL LOGIC,)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 736 2-2-6 DIV. 30

(*AIR TRAFFIC CONTROL SYSTEMS, *CIVIL AVIATION, *RADAR NAVIGATION, *RADAR BEACONS, AUTOMATIC, *RADAR TRACKING, RADAR SIGNALS, *DATA PROCESSING SYSTEMS, CODING, DISPLAY SYSTEMS, EFFECTIVENESS, ANALYSIS,) (AERIAL TARGETS, FLIGHT PATHS, RADAR TRACKING, IDENTIFICATION SYSTEMS, POSITION FINDING, RELIABILITY,)
AIRBORNE INSTRUMENTS LAB., INC., DEER PARK, LONG ISLAND, N. Y.
AD-273 742 62-2-6 DIV. 6

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, DESIGN, FILMS,) (*MEMORY DEVICES, *MAGNETIC TAPE, COMPUTER LOGIC,) (THIN FILMS, FERROMAGNETIC MATERIALS, DESIGN,) (ELECTRONIC CIRCUITS, AMPLIFIERS, TRANSISTORS,)
REMINGTON RAND UNIVAC DIV., SPERRY CORP., ST. PAUL, MINN.
AD-273 748 62-2-6 DIV. 30

(*INFORMATION THEORY, *MEMORY DEVICES, DATA STORAGE SYSTEMS, DATA TRANSMISSION SYSTEMS,) (MAGNETIC TAPE, COMPUTERS, *DATA PROCESSING SYSTEMS, SWITCHING CIRCUITS, *COMPUTER LOGIC, SEQUENCES, CODING, PROBABILITY,) (TIME INTERVAL COUNTERS, ERRORS, ANALYSIS,) THESES,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON, MASS.
AD-273 785 62-2-6 DIV. 30

***DATA STORAGE SYSTEMS**

(*MAGNETIC RECORDING SYSTEMS, *MAGNETIC TAPE, RECORDING DEVICES, MINIATURE ELECTRONIC EQUIPMENT, TRANSISTORS, DESIGN, TESTS, TEST METHODS,) *DATA STORAGE SYSTEMS,
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 764 62-2-6 DIV. 5

***DATA TRANSMISSION SYSTEMS**

(*AIR FORCE COMMUNICATIONS, *RADIO RELAY STATIONS, *RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, *RADIO COMMUNICATION SYSTEMS, *DATA TRANSMISSION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS, *VOICE COMMUNICATION SYSTEMS, RADIO RECEIVERS, TELETYPE SYSTEMS,) (COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, ANALOG TO DIGITAL CONVERTERS, DATA STORAGE SYSTEMS, DATA PROCESSING SYSTEMS,) RADIO SIGNALS, REFLECTIONS,
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

***DECELERATION**

(DENSITY OF AIR IN *SATELLITE VEHICLES, ORBITAL FLIGHT PATHS, *DECELERATION, EQUATIONS,) (*HYDROSTATIC PRESSURE, GAS FLOW, PERTURBATION THEORY,) (FUNCTIONS, POLYNOMIALS, INTEGRAL EQUATIONS,)
AIR FORCE PROVING GROUND COMMAND, EGLIN AIR FORCE BASE, FLA.
AD-273 680 62-2-6 DIV. 12

***DECONTAMINATION**

(*MUSTARD GAS, VAPORIZATION, EVAPORATION, PENETRATION, SURFACES, PAINTS, FILMS,) (*CHEMICAL WARFARE AGENTS, *DECONTAMINATION BY CLIMATIC FACTORS, ATMOSPHERE,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 637 62-2-6 DIV. 3

***DEFORMATION**

(GEOLOGY, *GEOPHYSICS, EARTH, *DEFORMATION BY *NUCLEAR EXPLOSIONS IN SALTS, ROCK,) (*DETONATION WAVES, FRACTURE (MECHANICS), FRAGMENTATION OF TERRAIN,) (*AERIAL PHOTOGRAPHY, EXPERIMENTAL DATA,) NEW MEXICO, STANFORD RESEARCH INST., MENLO PARK, CALIF.
AD-273 519 62-2-6 DIV. 2

(*WAVE TRANSMISSION, *STRESSES, *BLAST (LOADING), *DEFORMATION, ELASTICITY, PLASTICITY, MECHANICS,) (DISLOCATIONS OF *CRYSTAL STRUCTURE, LATTICES IN SOLIDS, *RODS, *STRUCTURAL SHELLS, ELASTIC SHELLS,) (POTENTIAL THEORY, PARTIAL DIFFERENTIAL EQUATIONS, HARMONIC ANALYSIS, FOURIER ANALYSIS,) CONTINUUM MECHANICS, LOAD DISTRIBUTION,
AMERICAN MACHINE AND FOUNDRY CO., NILES, ILL.
AD-273 534 62-2-6 DIV. 25

(*FATIGUE (MECHANICS), SOLIDS, *ELASTICITY, *PLASTICITY, *DEFORMATION, *SHEETS, STRESSES, SHEAR STRESSES, LOAD DISTRIBUTION, MATHEMATICAL ANALYSIS, EQUATIONS,)
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 832 62-2-6 DIV. 25

***DENSITY**

(*SEA WATER, *DENSITY IN THE *OCEANS AS A METHOD OF DEPTH FINDING FOR *PRESSURE VESSELS, DESIGN,)
NAVAL ORDNANCE LAB., WHITE OAK, MD.
AD-273 634 62-2-6 DIV. 2

***DETECTION**

(*DETECTION OF *SONAR SIGNALS, *UNDERWATER SOUND SIGNALS, *UNDERWATER SOUND IN PRESENCE OF NOISE USING CORRELATION TECHNIQUES,) SIGNAL-TO-NOISE RATIO, ACOUSTICS, ACOUSTIC DETECTORS, FOURIER ANALYSIS, INTEGRAL TRANSFORMS,
LITTON SYSTEMS, INC., WALTHAM, MASS.
AD-273 639 62-2-6 DIV. 6

***DETONATION WAVES**

(GEOLOGY, *GEOPHYSICS, EARTH, *DEFORMATION BY *NUCLEAR EXPLOSIONS IN SALTS, ROCK,) (*DETONATION WAVES, FRACTURE (MECHANICS), FRAGMENTATION OF TERRAIN,) (*AERIAL PHOTOGRAPHY, EXPERIMENTAL DATA,) NEW MEXICO, STANFORD RESEARCH INST., MENLO PARK, CALIF.
AD-273 519 62-2-6 DIV. 2

***DIELECTRIC FILMS**

(*STORAGE TUBES, *DISPLAY SYSTEMS, *THIN FILMS, *DIELECTRIC FILMS, ZINC COMPOUNDS, SULFIDES, *ELECTRON BOMBARDMENT, ION BOMBARDMENT, ELECTRICAL CONDUCTANCE, PROCESSING, HEAT TREATMENT, CRYSTALS, GROWTH,) X-RAY DIFFRACTION ANALYSIS,
HUGHES AIRCRAFT CO., MALIBU, CALIF.
AD-273 628 62-2-6 DIV. 8

***DIFFUSERS**

(LIQUID JETS, JETS INTO DUCT INLETS TO *DIFFUSERS FOR *JET PUMPS, HYDRODYNAMICS, PRESSURE, TESTS, MATHEMATICAL ANALYSIS,) (JETS, AIR IN WATER,)
JET PROPULSION CENTER, PURDUE U., LAFAYETTE, IND.
AD-273 877 62-2-6 DIV. 9

***DIGITAL COMPUTERS**

(TERRAIN, *ROADS, *VEHICLES, MOTION, SIMULATION ON *DIGITAL COMPUTERS,) (*VEHICLE WHEELS, *PROGRAMMING, COMPUTERS,
ORDNANCE TANK-AUTOMOTIVE COMMAND, DETROIT, MICH.
AD-273 687 62-2-6 DIV. 11

(*DIGITAL COMPUTERS, *PROGRAMMING OF *SHIELDING, PENETRATION OF *GAMMA RAY, *NEUTRON SPECTRUM FROM LEAKAGE OF *RESEARCH REACTORS,)
GENERAL DYNAMICS/FORT WORTH, TEX.
AD-273 698 62-2-6 DIV. 30

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, *COMPUTERS, MEMORY DEVICES, CIRCUITS, ANALOG-TO-DIGITAL CONVERTERS, DESIGN, MAGNETIC MATERIALS, FILMS,) (PSYCHOLOGY, *SPEECH, AUTOMATIC SPEECH REPRESENTATION,) MATHEMATICAL ANALYSIS,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON, MASS.
AD-273 908 62-2-6 DIV. 30

(*DIGITAL COMPUTERS, SOLID STATE PHYSICS, DATA PROCESSING SYSTEMS, *ELECTRONIC SCANNERS, ELECTRONIC EQUIPMENT, SUPERSONIC WIND TUNNELS,)
ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AIR FORCE STATION, TENN.
AD-273 607 62-2-6 DIV. 30

(*ANALOG-TO-DIGITAL CONVERTERS, *DIGITAL COMPUTERS, *DATA PROCESSING SYSTEMS, RECORDING DEVICES, CODING, PROGRAMMING, PUNCHED CARD METHODS, MAGNETIC TAPE,) (NECN, SWITCHING CIRCUITS, TRIGGERED GATES,)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 669 62-2-6 DIV. 30

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, DESIGN, FILMS,) (*MEMORY DEVICES, *MAGNETIC TAPE, COMPUTER LOGIC,) (THIN FILMS, FERROMAGNETIC MATERIALS, DESIGN,) (ELECTRONIC CIRCUITS, AMPLIFIERS, TRANSISTORS,)
REMINGTON RAND UNIVAC DIV., SPERRY CORP., ST. PAUL, MINN.
AD-273 748 62-2-6 DIV. 30

(DATA PROCESSING SYSTEMS, DATA STORAGE SYSTEMS, COMPUTER LOGIC, *DIGITAL COMPUTERS, *MEMORY DEVICES, *MAGNETIC CORES, *MAGNETIC TAPE, FERROMAGNETIC MATERIALS,) (MANUFACTURING METHODS, PROCESSING, MAGNETIC TAPES, ELECTRODEPOSITION, METALLIC SMOKE DEPOSITS, *THIN FILMS, GLASS, METALS,)
REMINGTON RAND UNIVAC DIV., SPERRY RAND CORP., ST. PAUL, MINN.
AD-273 749 62-2-6 DIV. 30

(*SEMICONDUCTORS, SILICON ALLOYS, ELECTRONIC CIRCUITS, MATERIALS, PROCESSING, MANUFACTURING METHODS, CHEMICAL MILLING, DIFFUSION, PACKAGING,) (*DIGITAL COMPUTERS, *SUBMINIATURE ELECTRONIC EQUIPMENT, *MINIATURE ELECTRONIC EQUIPMENT, ELECTRONIC CIRCUITS, SWITCHING CIRCUITS, TRANSISTORS, DIODES, RESISTORS, CAPACITORS, DESIGN, TESTING,)
TEXAS INSTRUMENTS INC., DALLAS, TEX.
AD-273 850 62-2-6 DIV. 8

***DIGITAL SYSTEMS**

(COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, *DIGITAL SYSTEMS, *LINEAR SYSTEMS, *CODING, SEQUENCES, COMPUTER LOGIC, TEST METHODS, TESTS, OPERATION.) (DIGITAL COMPUTERS, ERRORS, CORRECTION.)
MONTANA STATE COLL., BOZEMAN.
AD-273 741 62-2-6 DIV. 30

(*AIR FORCE COMMUNICATIONS, *RADIO RELAY STATIONS, *RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, *RADIO COMMUNICATION SYSTEMS, *DATA TRANSMISSION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS, *VOICE COMMUNICATION SYSTEMS, RADIO RECEIVERS, TELETYPE SYSTEMS.) (COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, ANALOG TO DIGITAL CONVERTERS, DATA STORAGE SYSTEMS, DATA PROCESSING SYSTEMS.) RADIO SIGNALS, REFLECTIONS.
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

***DIODES**

(*SEMICONDUCTORS, *DIODES, *MODULATORS, DETECTORS, CIRCUITS, DESIGN, TRANSISTORS, *ELECTRONIC CIRCUITS, HIGH FREQUENCY, VERY HIGH FREQUENCY, THEORY, OPERATION, MEASUREMENT, MATHEMATICAL ANALYSIS, *BIBLIOGRAPHY.)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 510 62-2-6 DIV. 8

(*PARAMETRIC AMPLIFIERS, *DIODES, ELECTRICAL PROPERTIES, ELECTRONIC CIRCUITS, IMPEDANCE MEASUREMENT,) (MICROWAVE AMPLIFIERS, SEMICONDUCTORS, MATERIALS, NONLINEAR SYSTEMS, THEORY, MATHEMATICAL ANALYSIS, COMPUTERS,)
NORWEGIAN DEFENCE RESEARCH ESTABLISHMENT.
AD-273 572 62-2-6 DIV. 8

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRON BEAMS, TEST EQUIPMENT,) *OXIDE CATHODES, *CATHODES (ELECTRON TUBES), *DIODES,
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 806 62-2-6 DIV. 8

***DIOXIDES**

(SINTERED, *ZIRCONIUM COMPOUNDS, *DIOXIDES, *CALCIUM COMPOUNDS, *ZIRCONATES, YTTRIUM COMPOUNDS, OXIDES, CERIUM COMPOUNDS, REFRACTORY MATERIALS, CERAMIC MATERIALS, HIGH TEMPERATURE RESEARCH,) (TEST METHODS, *THERMODYNAMICS, THERMAL STRESSES, THERMAL EXPANSION, THERMAL CONDUCTIVITY, BLACK-BODY RADIATION, SPECIFIC HEAT, MELTING, CRYSTAL STRUCTURE, DENSITY, POROSITY,) TABLES, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES,
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 802 62-2-6 DIV. 14

***DIPOLE ANTENNAS**

(*DIPOLE ANTENNAS, COMMUNICATION EQUIPMENT, ANTENNA RADIATION PATTERNS, LOW FREQUENCY, VERY LOW FREQUENCY, UNDERGROUND STRUCTURES,) ANTENNAS, COMMUNICATION SYSTEMS, RADIO WAVES, PROPAGATION, ATTENUATION, ELECTRICAL PROPERTIES, SOILS,
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 675 62-2-6 DIV. 8

(FEASIBILITY STUDIES OF *PHYSICAL PROPERTIES OF *DIPOLE ANTENNAS,) (MEASUREMENT OF ADMITTANCE, ELECTRICAL CONDUCTANCE, ELECTROSTATIC CAPACITANCE, ELECTRIC CURRENTS,) (STORAGE TANKS, *LIQUIDS, WATER,) (*EXPERIMENTAL DATA, TABLES,)
GORDON MCKAY LAB. OF APPLIED SCIENCE, HARVARD U., CAMBRIDGE, MASS.
AD-273 687 62-2-6 DIV. 8

(*ELECTROMAGNETIC WAVES, *ELECTROMAGNETIC FIELDS, POLARIZATION, DISTORTION,) (*DIPOLE ANTENNAS, LINEAR SYSTEMS, EARTH, SOILS, TERRAIN, ELECTRICAL PROPERTIES,) (RADIOFREQUENCY, HIGH FREQUENCY, MEASUREMENT, MATHEMATICAL ANALYSIS,) COMMUNICATION SYSTEMS,
ARMY SIGNAL RESEARCH AND DEVELOPMENT LAB., FORT MONMOUTH, N. J.
AD-273 790 62-2-6 DIV. 8

(*MICROWAVES, *ELECTRIC FIELDS, *MAGNETIC FIELDS, MEASUREMENT, SCATTERING, WIRE, RESONANCE, MATHEMATICAL ANALYSIS, THEORY,) *DIPOLE ANTENNAS,
SYRACUSE U. RESEARCH INST., N. Y.
AD-273 847 62-2-6 DIV. 8

***DISCHARGE TUBES**

(*HIGH FREQUENCY, *PLASMA OSCILLATIONS OF ELECTRONS, LOW PRESSURE RESEARCH IN *GAS DISCHARGES,) (*ELECTRON BEAMS, SCATTERING, EXCITATION,) (*DISCHARGE TUBES, CATHODES, AMPLIFIERS, ELECTRODES, OSCILLOSCOPE PROBES, RADIO RECEIVERS,) USSR,
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 884 62-2-6 DIV. 25

***DISPLAY SYSTEMS**

(*STORAGE TUBES, *DISPLAY SYSTEMS, *THIN FILMS, *DIELECTRIC FILMS, ZINC COMPOUNDS, SULFIDES, *ELECTRON BOMBARDMENT, ION BOMBARDMENT, ELECTRICAL CONDUCTANCE, PROCESSING, HEAT TREATMENT, CRYSTALS, GROWTH,) X-RAY DIFFRACTION ANALYSIS,
HUGHES AIRCRAFT CO., MALIBU, CALIF.
AD-273 638 62-2-6 DIV. 8

***DISSOCIATION**

(*IONIZATION, *REACTION KINETICS, *DISSOCIATION, *RECOMBINATION REACTIONS,) (GAS IONIZATION, RARE GASES, MOLECULAR ASSOCIATION,) (MEASUREMENT OF IONIZATION BASED ON ELECTROSTATICS, MICROWAVES, MASS SPECTROMETERS,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 673 62-2-6 DIV. 20

***DOPPLER TRACKING**

(SPACESHIPS, SPACE PROBES, LUNAR PROBES, SPACE FLIGHT, *RADAR TRACKING, GUIDED MISSILE TRACKING SYSTEMS, RADIO ASTRONOMY, *DOPPLER TRACKING, DOPPLER SYSTEMS, COMMAND SYSTEMS, TELEMETER SYSTEMS, COMMUNICATION SYSTEMS, DATA PROCESSING SYSTEMS, INSTRUMENTATION, *RADAR STATIONS,)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 813 62-2-6 DIV. 6

***DOSIMETERS**

(*THERMAL NEUTRONS, *FAST NEUTRONS, *DOSIMETERS, RADIOACTIVE FILMS, PHOTOGRAPHIC EMULSIONS, DETECTORS,) (*BATEN BOILER REACTORS, GAMMA RAYS, GAMMA EMISSION, SENSITIVITY, PHOTONS,) (CADMIUM, LITHIUM, GOLD, FUELS,) EXPERIMENTAL DATA,
NUCLEAR DEFENSE LAB., ARMY CHEMICAL CENTER, MD.
AD-273 496 62-2-6 DIV. 20

***DRAG**

(THEORY, BOUNDARY LAYER, *FLUID FLOW, *SHEAR STRESSES ALONG CYLINDRICAL BODIES,) (*DRAG, TURBULENCE, LAMINAR BOUNDARY LAYER, FLUID MECHANICS, VISCOSITY,) (TOWING CABLES, *HYDRODYNAMICS, TESTS,)
TEXAS A. AND M. COLL., COLLEGE STATION.
AD-273 862 62-2-6 DIV. 9

***ECHO RANGING**

(*MOON, RADIO SIGNALS, VERY HIGH FREQUENCY, RADIOFREQUENCY SPECTRUM ANALYZERS, ELECTROMAGNETIC WAVES, REFLECTION, *EXTRATERRESTRIAL RADIO WAVES, *RADIO ASTRONOMY, *AURORAE,) (*ECHO RANGING, DOPPLER SYSTEMS, PARABOLIC ANTENNAS, *IONOSPHERE, POLARIZATION,) (INSTRUMENTATION, OSCILLATORS, OSCILLATOR CIRCUITS, PARAMETRIC AMPLIFIER, RECORDING DEVICES,)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 686 62-2-6 DIV. 2

***ELASTICITY**

(*POLYMERS, BUTENES, STYRENES, ETHYLENES, SULFIDES, PROPENES, FURAN, BUTADIENES, RUBBER, ACRYLIC RESINS,) (DEFORMATION, *VISCOSITY, *PLASTICITY, STRESSES, RELAXATION TIME, TEMPERATURE,) TABLES,
FRICK CHEMICAL LAB., PRINCETON U., N. J.
AD-273 575 62-2-6 DIV. 14

(*FATIGUE (MECHANICS), SOLIDS, *ELASTICITY, *PLASTICITY, *DEFORMATION, *SHEETS, STRESSES, SHEAR STRESSES, LOAD DISTRIBUTION, MATHEMATICAL ANALYSIS, EQUATIONS,)
MASSACHUSETTS INST. OF TECH., CAMBRIDGE,
AD-273 832 62-2-6 DIV. 25

***ELASTOMERS**

(*MATERIALS FOR SPACESHIPS AND SATELLITE VEHICLES, *REFRACTORY MATERIALS, *ALLOYS, *COATINGS, METALLIC TEXTILES, SOLID ROCKET PROPELLANTS, *METALS, FOAMS, BERYLLIUM COMPOUNDS, OXIDES, OPTICS, ABLATION, *PLASTICS, *ELASTOMERS, ADHESIVES, FILAMENT WOUND CONSTRUCTION, CRYOGENICS, SHIELDING,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 676 62-2-6 DIV. 14

(*VULCANIZATES, ADDITIVES, *ELASTOMERS, *RADIOACTIVATION ANALYSIS, *RUBBER, *RADIATION EFFECTS, GAMMA EMISSION,)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 636 2-2-6 DIV. 20

(*ELASTOMERS, DESIGN, DATA, *HANDBOOKS, PROCESSING, CASTING, PLASTIC COATINGS, VULCANIZATION,) (MECHANICAL PROPERTIES, PHYSICAL PROPERTIES, THERMAL CONDUCTIVITY, ELECTRICAL PROPERTIES, AGING, HEAT, OXIDATION, OZONE,) (COMPATIBILITY WITH PETROLEUM, FUELS, LUBRICANTS, HYDRAULIC FLUIDS, LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, ROCKET FUELS,) (RADIATION EFFECTS, LOW PRESSURE RESEARCH, VIBRATION ISOLATORS, SEALS, SPRINGS,) (ELASTICITY, PLASTICITY, STRESSES, DEFORMATION, SHOCK RESISTANCE,) AIRFRAMES, SPACESHIPS, SATELLITE VEHICLES,
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
AD-273 880 62-2-6 DIV. 14

***ELECTRIC DETONATORS**

(*ELECTRIC DETONATORS, *ELECTRIC IGNITERS, ELECTROMAGNETIC WAVES, HAZARDS,) (*ELECTRONIC CIRCUITS, *RADIOFREQUENCY FILTERS, LOW-PASS FILTERS, RADIOFREQUENCY ATTENUATORS, RADIOFREQUENCY TRANSFORMERS, RADIOFREQUENCY COILS, DESIGN, SAFETY DEVICES, EFFECTIVENESS,) TRANSISTORS, ELECTRONIC SWITCHES, DIODES, LABORATORIES FOR RESEARCH AND DEVELOPMENT,
FRANKLIN INST., PHILADELPHIA, PA.
AD-273 548 62-2-6 DIV. 22

(THEORY OF RHOMBIC, *ANTENNAS FOR DETERMINATION OF THE *ELECTROMAGNETIC *WAVES, *RADIOFREQUENCY, SENSITIVITY, HAZARDS AND SAFETY, DISTANCES FOR *ELECTRIC DETONATORS,) RADAR EQUIPMENT, ELECTROMAGNETIC FIELDS, HAZARDS,
AMMUNITION GROUP, PICATINNY ARSENAL, DOVER, N. J.
AD-273 668 62-2-6 DIV. 22

(*ELECTRIC DETONATORS, *ELECTRIC IGNITERS, RADIOFREQUENCY, ELECTRODES, EMBEDDING SUBSTANCES, MOLDING MATERIALS, GRAPHITE, EPOXY RESINS, ANTIMONY, BARIUM COMPOUNDS, NITRATES, ZIRCONIUM, RESISTANCE, COATINGS, MANUFACTURING METHODS, PROCESSING,) IGNITERS, SPARKS, ELECTRIC CURRENTS, SPARK IGNITION,
SCINTILLA MAGNETO DIV., BENDIX CORP., SIDNEY, N. Y.
AD-273 864 62-2-6 DIV. 22

***ELECTRIC FIELDS**

(*MICROWAVES, *ELECTRIC FIELDS, *MAGNETIC FIELDS, MEASUREMENT, SCATTERING, WIRE, RESONANCE, MATHEMATICAL ANALYSIS, THEORY,) *DIPOLE ANTENNAS,
SYRACUSE U. RESEARCH INST., N. Y.
AD-273 847 62-2-6 DIV. 8

***ELECTRIC IGNITERS**

(*ELECTRIC DETONATORS, *ELECTRIC IGNITERS, ELECTROMAGNETIC WAVES, HAZARDS,) (*ELECTRONIC CIRCUITS, *RADIOFREQUENCY FILTERS, LOW-PASS FILTERS, RADIOFREQUENCY ATTENUATORS, RADIOFREQUENCY TRANSFORMERS, RADIOFREQUENCY COILS, DESIGN, SAFETY DEVICES, EFFECTIVENESS,) TRANSISTORS, ELECTRONIC SWITCHES, DIODES, LABORATORIES FOR RESEARCH AND DEVELOPMENT,
FRANKLIN INST., PHILADELPHIA, PA.
AD-273 548 62-2-6 DIV. 22

(*ELECTRIC DETONATORS, *ELECTRIC IGNITERS, RADIOFREQUENCY, ELECTRODES, EMBEDDING SUBSTANCES, MOLDING MATERIALS, GRAPHITE, EPOXY RESINS, ANTIMONY, BARIUM COMPOUNDS, NITRATES, ZIRCONIUM, RESISTANCE, COATINGS, MANUFACTURING METHODS, PROCESSING,) IGNITERS, SPARKS, ELECTRIC CURRENTS, SPARK IGNITION,
SCINTILLA MAGNETO DIV., BENDIX CORP., SIDNEY, N. Y.
AD-273 864 62-2-6 DIV. 22

***ELECTRIC POWER PRODUCTION**

(*POWER SUPPLIES, *ELECTRIC POWER PRODUCTION, DIRECT CURRENT, ELECTRONIC EQUIPMENT, ELECTRICAL EQUIPMENT FOR FLOATING BODIES IN THE OCEANS,) (FUEL CELLS, DRY CELLS, STORAGE BATTERIES, THERMOELECTRICITY, LIQUEFIED GASES, *GENERATORS, INTERNAL COMBUSTION ENGINES, COSTS, RELIABILITY, DESIGN FOR NAVAL EQUIPMENT,)
KAYE, JOSEPH, AND CO., INC., CAMBRIDGE, MASS.
AD-273 556 62-2-6 DIV. 7

(*POWER SUPPLIES, *ELECTRIC POWER PRODUCTION, DIRECT CURRENT, ELECTRONIC EQUIPMENT, ELECTRICAL EQUIPMENT FOR FLOATING BODIES IN THE OCEANS,) PRIMARY BATTERIES, STORAGE BATTERIES, SEA WATER BATTERIES, FUEL CELLS, MAGNETOHYDRODYNAMICS, SOLID STATE PHYSICS, SOLAR ENERGY, THERMOELECTRICITY, *GENERATORS,
KAYE, JOSEPH, AND CO., INC., CAMBRIDGE, MASS.
AD-273 557 62-2-6 DIV. 7

(*PHOTOELECTRIC CELLS, *SOLAR CELLS, GALLIUM COMPOUNDS, ARSENIDES, PHOSPHIDES, MANUFACTURING METHODS, DIFFUSION,) *ELECTRIC POWER PRODUCTION, POWER SUPPLIES, SOLAR ENERGY, THERMOELECTRICITY,
EAGLE-PICHER RESEARCH LABS., MIAMI, OKLA.
AD-273 807 62-2-6 DIV. 7

(*ELECTRIC POWER PRODUCTION, *POWER SUPPLIES, *THERMOELECTRICITY, *THERMIONIC EMISSION, *FUEL CELLS, GENERATORS, *VOLTAGE REGULATORS, SWITCHING CIRCUITS, CONTROL SYSTEMS, INVERTED RECTIFIERS, TRANSISTORS, RECTIFIERS, STABILITY, DESIGN,) (POWER SUPPLIES, SOURCES, VOLTAGE, IMPEDANCE, ELECTRONIC CIRCUITS, SEMICONDUCTORS, TESTS,)
GENERAL ELECTRIC CO., WEST LYNN, MASS.
AD-273 869 62-2-6 DIV. 7

***ELECTRICAL CONDUCTANCE**

(MEASUREMENT, *ELECTRICAL CONDUCTANCE OF AIR, IONIZATION DURING *RE-ENTRY AERODYNAMICS.) (*INSTRUMENTATION, DESIGN OF SHOCK WAVES, *CONDUCTIVITY, *METERS FOR SATELLITE VEHICLES.) (CALIBRATION AND FLIGHT TESTING UNDER *SPACE ENVIRONMENTAL CONDITIONS.) (MAGNETOHYDRODYNAMICS, EXPERIMENTAL DATA, RELIABILITY.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 478 62-2-6 DIV. 9

(MEASUREMENT OF GAS FLOW BY SENSITIVITY OF *ELECTRICAL CONDUCTANCE, *INSTRUMENTATION, CALIBRATION.) (TRANSDUCERS, TESTS, STANDARDS OF *ABLATION, *MATERIALS, *ELECTRICAL PROPERTIES.) (*PLASMA JETS, GAS IONIZATION IN RE-ENTRY AERODYNAMICS.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 591 62-2-6 DIV. 25

***ELECTRICAL EQUIPMENT**

(*MAGNETOHYDRODYNAMICS, *GENERATORS, ELECTROMAGNETIC FIELDS IN ROTATION.) (*ELECTRICAL EQUIPMENT, ELECTRIC MOTORS, TURBINES, *GAS TURBINE ROTORS,) (HYDRODYNAMICS OF EQUATIONS, MOTION, PARTIAL DIFFERENTIAL EQUATIONS,) USSR.
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 885 62-2-6 DIV. 25

***ELECTRICAL NETWORKS**

(ASTRONOMY, *SUN, *TRACKING BY *COMMUNICATION SYSTEMS, INTERFEROMETERS, *ELECTRICAL NETWORKS, ANTENNAS,) (SOLAR DISTURBANCES, SOLAR FLARES, SOLAR CORONA, NOISE (RADIO),) (INSTRUMENTATION, PREAMPLIFIERS, DETECTORS, BAND-PASS FILTERS, RECORDING DEVICES.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 487 62-2-6 DIV. 2

(*ELECTRICAL NETWORKS, LINEAR SYSTEMS, *NONLINEAR SYSTEMS, ANALYSIS BY *OPERATORS (MATHEMATICS), DIGITAL COMPUTERS,) (*ELECTRONIC CIRCUITS, DIODES, TRANSISTORS, ELECTRON TUBES, MATHEMATICAL ANALYSIS, THEORY, PROGRAMMING.)
STANFORD ELECTRONICS LABS., STANFORD U., CALIF.
AD-273 849 62-2-6 DIV. 8

***ELECTRICAL PROPERTIES**

(MEASUREMENT OF GAS FLOW BY SENSITIVITY OF *ELECTRICAL CONDUCTANCE, *INSTRUMENTATION, CALIBRATION,) (TRANSDUCERS, TESTS, STANDARDS OF *ABLATION, *MATERIALS, *ELECTRICAL PROPERTIES,) (*PLASMA JETS, GAS IONIZATION IN RE-ENTRY AERODYNAMICS.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 591 62-2-6 DIV. 25

***ELECTROACOUSTIC TRANSDUCERS**

(SONAR, *ANTENNA RADIATION PATTERNS, VERY LOW FREQUENCY, *TRANSDUCERS, CALIBRATION, TESTS, MEASUREMENT IN WATER TUNNELS, TEST FACILITIES,) (ANTISUBMARINE WARFARE, *SONAR EQUIPMENT, SCANNING SONAR, DIRECTION FINDING, PRESSURE, PHASE MEASUREMENT, DETERMINATION,) *ELECTROACOUSTIC TRANSDUCERS.
DEFENSE RESEARCH LAB., U. OF TEXAS, AUSTIN.
AD-273 522 62-2-6 DIV. 6

***ELECTROCARDIOGRAPHY**

(*ELECTROCARDIOGRAPHY, PRIMATES, MEASUREMENT,)
AEROSPACE MEDICAL LAB., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 667 62-2-6 DIV. 16

***ELECTROLYTIC CELLS**

(*FUEL CELLS, *ALKALINE CELLS, *ELECTROLYTIC CELLS, FUELS, HYDRAZINES, FORMALDEHYDE, AMMONIA, NICKEL ELECTRODES, PLATINUM, ANODES (ELECTROLYTIC CELL), CATHODES (ELECTROLYTIC CELL), ELECTROCHEMISTRY, DESIGN,) PRIMARY BATTERIES, STORAGE BATTERIES.
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
AD-273 702 2-2-6 DIV. 7

***ELECTROMAGNETIC FIELDS**

(*SATELLITE VEHICLES, *GUIDED MISSILES, SURFACE TO SURFACE, RADAR TRACKING, RADIO INTERFEROMETERS, *TRACKING,) *PLASMA PHYSICS, *ELECTROMAGNETIC FIELDS, WAVE TRANSMISSION, ELECTROMAGNETIC WAVES, MAGNETOHYDRODYNAMICS, *IONOSPHERIC DISTURBANCES, IONS, IONOSPHERE, UPPER ATMOSPHERE, *RADIO ASTRONOMY, RADIO WAVES, EXTRATERRESTRIAL RADIO WAVES, ANTENNA RADIATION PATTERNS, USSR.
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 937 62-2-6 DIV. 12

(*ELECTROMAGNETIC WAVES, *ELECTROMAGNETIC FIELDS, POLARIZATION, DISTORTION,) (*DIPOLE ANTENNAS, LINEAR SYSTEMS, EARTH, SOILS, TERRAIN, ELECTRICAL PROPERTIES,) (RADIOFREQUENCY, HIGH FREQUENCY, MEASUREMENT, MATHEMATICAL ANALYSIS,) COMMUNICATION SYSTEMS.
ARMY SIGNAL RESEARCH AND DEVELOPMENT LAB., FORT MONMOUTH, N. J.
AD-273 790 62-2-6 DIV. 8

***ELECTROMAGNETIC WAVES**

(THEORY OF *PROPAGATION OF *ELECTROMAGNETIC WAVES AROUND *SPHERES, EARTH,) (*TERRESTRIAL MAGNETISM, CONDUCTIVITY, DIELECTRICS, ATTENUATION,) (*WAVE ANALYSIS, POLYNOMIALS, INTEGRAL EQUATIONS, TRANSFORMATIONS (MATHEMATICS),) NUMERICAL ANALYSIS BY COMPUTERS.
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 663 62-2-6 DIV. 25

(*MAGNETOHYDRODYNAMICS, *EXTREMELY LOW FREQUENCY, *ELECTROMAGNETIC WAVES, MAGNETIC FIELDS, OSCILLATIONS, CONDUCTIVITY, WAVES,) (*TERRESTRIAL MAGNETISM, *SOLAR DISTURBANCES, *FLUID FLOW,) (TRANSFORMATIONS (MATHEMATICS), PARTIAL DIFFERENTIAL EQUATIONS, PERTURBATION THEORY,)
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 692 62-2-6 DIV. 25

(THEORY OF RHOMBIC, *ANTENNAS FOR DETERMINATION OF THE *ELECTROMAGNETIC WAVES, *RADIOFREQUENCY, SENSITIVITY, HAZARDS AND SAFETY, DISTANCES FOR *ELECTRIC DETONATORS,) RADAR EQUIPMENT, ELECTROMAGNETIC FIELDS, HAZARDS.
AMMUNITION GROUP, PICATINNY ARSENAL, DOVER, N. J.
AD-273 648 62-2-6 DIV. 22

(*ELECTROMAGNETIC WAVES, PROPAGATION IN *WEAKLY *IONIZATION (IONIZED) *AIR WITHIN MAGNETIC FIELDS,) (EXPERIMENTAL DATA, TABLES,) NUMERICAL ANALYSIS.
SPACE TECHNOLOGY LABS., INC., REDONDO BEACH, CALIF.
AD-273 650 62-2-6 DIV. 25

(*ELECTROMAGNETIC WAVES, *ELECTROMAGNETIC FIELDS, POLARIZATION, DISTORTION,) (*DIPOLE ANTENNAS, LINEAR SYSTEMS, EARTH, SOILS, TERRAIN, ELECTRICAL PROPERTIES,) (RADIOFREQUENCY, HIGH FREQUENCY, MEASUREMENT, MATHEMATICAL ANALYSIS,) COMMUNICATION SYSTEMS.
ARMY SIGNAL RESEARCH AND DEVELOPMENT LAB., FORT MONMOUTH, N. J.
AD-273 790 62-2-6 DIV. 8

(FEASIBILITY STUDIES FOR THE DETECTION AND IDENTIFICATION OF *UNDERGROUND EXPLOSIONS,) (*NUCLEAR EXPLOSIONS, SEISMOLOGICAL STATIONS, LOW FREQUENCY, *ELECTROMAGNETIC WAVES, SEISMIC WAVES,) (DETECTION OF ATOMIC BOMB EXPLOSIONS.)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 825 62-2-6 DIV. 20

***ELECTRON BEAMS**

INTERACTIONS BETWEEN *PLASMA OSCILLATIONS AND VELOCITY MODULATION, *ELECTRON BEAMS,) (*HARMONIC ANALYSIS, BESSEL FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, NONLINEAR SYSTEMS,) (CATHODE RAY TUBES, KLYSTRONS, DIELECTRICS,)
MICROWAVE LAB., STANFORD U., CALIF.
AD-273 706 2-2-6 DIV. 25

(ANALYSIS OF *ELECTRON BEAMS, *CAMERA TUBES OF *RADIO SIGNALS, CYLINDRICAL BODIES, DESIGN,) (*RADIOFREQUENCY POWER, MICROWAVE EQUIPMENT, CAVITY RESONATORS, RESONANCE, ELECTROMAGNETIC WAVES, OSCILLATION,) (MOTION OF ELECTRONS, BESSEL FUNCTIONS, TAYLOR'S SERIES, DIFFERENTIAL EQUATIONS,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 781 62-2-6 DIV. 8

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (ELECTRON BEAMS, VELOCITY, MODULATION, DISTRIBUTION, MEASUREMENT, MATHEMATICAL ANALYSIS, CAVITY RESONATORS, ELECTRON GUNS,) (ELECTRON BEAMS, ELECTROMAGNETIC FIELDS, *SPACE CHARGES, *MICROWAVES, THEORY, MATHEMATICAL ANALYSIS, KLYSTRONS, NONLINEAR SYSTEMS, MICROWAVE AMPLIFIERS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 803 62-2-6 DIV. 8

(*ELECTRON BEAMS, *LINEAR SYSTEMS, ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRONIC CIRCUITS, ELECTRON BEAMS, ELECTRONS, INTERACTION,) (*KLYSTRONS, CAVITY RESONATORS, ELECTRON BEAMS, HARMONIC ANALYSIS, PLASMA PHYSICS, MAGNETIC FIELDS, MODULATION, PROPAGATION, SPACE CHARGES, MATHEMATICAL ANALYSIS,) MICROWAVE AMPLIFIERS, NONLINEAR SYSTEMS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 804 62-2-6 DIV. 8

(*ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (*KLYSTRONS, CAVITY RESONATORS, HARMONIC ANALYSIS, *RADIOFREQUENCY POWER, MEASUREMENTS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 805 62-2-6 DIV. 8

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRON BEAMS, TEST EQUIPMENT,) *OXIDE CATHODES, *CATHODES (ELECTRON TUBES), *DIODES.
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 806 62-2-6 DIV. 8

(*HIGH FREQUENCY, *PLASMA OSCILLATIONS OF ELECTRONS, LOW PRESSURE RESEARCH IN *GAS DISCHARGES,) (*ELECTRON BEAMS, SCATTERING, EXCITATION,) (*DISCHARGE TUBES, CATHODES, AMPLIFIERS, *ELECTRODES, OSCILLOSCOPE PROBES, RADIO RECEIVERS,) USSR, FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 886 62-2-6 DIV. 25

***ELECTRON BOMBARDMENT**

(*STORAGE TUBES, *DISPLAY SYSTEMS, *THIN FILMS, *DIELECTRIC FILMS, ZINC COMPOUNDS, SULFIDES, *ELECTRON BOMBARDMENT, ION BOMBARDMENT, ELECTRICAL CONDUCTANCE, PROCESSING, HEAT TREATMENT, CRYSTALS, GROWTH,) X-RAY DIFFRACTION ANALYSIS.
HUGHES AIRCRAFT CO., MALIBU, CALIF.
AD-273 628 62-2-6 DIV. 8

***ELECTRON TRANSITIONS**

(*ELECTRONS, GASES, POTENTIAL THEORY, *ELECTRON TRANSITIONS, *NUCLEAR ENERGY LEVELS,) (NUCLEI, STATISTICAL ANALYSIS,)
WEIZMANN INST. (ISRAEL).
AD-273 697 2-2-6 DIV. 25

***ELECTRON TUBES**

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (ELECTRON BEAMS, VELOCITY, MODULATION, DISTRIBUTION, MEASUREMENT, MATHEMATICAL ANALYSIS, CAVITY RESONATORS, ELECTRON GUNS,) (ELECTRON BEAMS, ELECTROMAGNETIC FIELDS, *SPACE CHARGES, *MICROWAVES, THEORY, MATHEMATICAL ANALYSIS, KLYSTRONS, NONLINEAR SYSTEMS, MICROWAVE AMPLIFIERS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 803 62-2-6 DIV. 8

(*ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (*KLYSTRONS, CAVITY RESONATORS, HARMONIC ANALYSIS, *RADIOFREQUENCY POWER, MEASUREMENTS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 805 62-2-6 DIV. 8

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (*ELECTRONIC CIRCUITS, DIODES, TRANSISTORS, ELECTRON TUBES, MATHEMATICAL ANALYSIS, THEORY, PROGRAMMING,)
STANFORD ELECTRONICS LABS., STANFORD U., CALIF.
AD-273 849 62-2-6 DIV. 8

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRON BEAMS, TEST EQUIPMENT,) *OXIDE CATHODES, *CATHODES (ELECTRON TUBES), *DIODES.
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 806 62-2-6 DIV. 8

***ELECTRONIC CIRCUITS**

(*SEMICONDUCTORS, *DIODES, *MODULATORS, DETECTORS, CIRCUITS, DESIGN, TRANSISTORS, *ELECTRONIC CIRCUITS, HIGH FREQUENCY, VERY HIGH FREQUENCY, THEORY, OPERATION, MEASUREMENT, MATHEMATICAL ANALYSIS, *BIBLIOGRAPHY,)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 810 62-2-6 DIV. 8

(*ELECTRIC DETONATORS, *ELECTRIC IGNITERS, ELECTROMAGNETIC WAVES, HAZARDS,) (*ELECTRONIC CIRCUITS, *RADIOFREQUENCY FILTERS, LOW-PASS FILTERS, RADIOFREQUENCY ATTENUATORS, RADIOFREQUENCY TRANSFORMERS, RADIOFREQUENCY COILS, DESIGN, SAFETY DEVICES, EFFECTIVENESS,) TRANSISTORS, ELECTRONIC SWITCHES, DIODES, LABORATORIES FOR RESEARCH AND DEVELOPMENT.
FRANKLIN INST., PHILADELPHIA, PA.
AD-273 848 62-2-6 DIV. 22

(*ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (*KLYSTRONS, CAVITY RESONATORS, HARMONIC ANALYSIS, *RADIOFREQUENCY POWER, MEASUREMENTS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 805 62-2-6 DIV. 8

(*SEMICONDUCTORS, GALLIUM COMPOUNDS, ARSENIDES, SILICON, CRYSTALS, GROWTH, SILICON COMPOUNDS, NIOAIDES, THIN FILMS,) (*ELECTRONIC CIRCUITS, TANTALUM CAPACITORS, RESISTORS OF NICKEL ALLOYS AND CHROMIUM ALLOYS AND CAPACITORS OF SILICON AND DIOXIDES,) MANUFACTURING METHODS.
MOTOROLA, INC., PHOENIX, ARIZ.
AD-273 829 62-2-6 DIV. 8

(*ELECTRICAL NETWORKS, LINEAR SYSTEMS, *NONLINEAR SYSTEMS, ANALYSIS BY *OPERATORS (MATHEMATICS), DIGITAL COMPUTERS,) (*ELECTRONIC CIRCUITS, DIODES, TRANSISTORS, ELECTRON TUBES, MATHEMATICAL ANALYSIS, THEORY, PROGRAMMING,)
STANFORD ELECTRONICS LABS., STANFORD U., CALIF.
AD-273 849 62-2-6 DIV. 8

***ELECTRONIC EQUIPMENT**

(*ELECTRONIC EQUIPMENT; AIRCRAFT EQUIPMENT; ELECTRIC CONNECTORS; ELECTRIC WIRE; *WELDING; WELDS; FEASIBILITY STUDIES; RELIABILITY.) (MATERIALS; METALS; ALLOYS; NICKEL; COPPER.)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 638 62-2-6 DIV. 8

***ELECTRONIC SCANNERS**

(*DIGITAL COMPUTERS; SOLID STATE PHYSICS; DATA PROCESSING SYSTEMS; *ELECTRONIC SCANNERS; ELECTRONIC EQUIPMENT; SUPERSONIC WIND TUNNELS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 607 62-2-6 DIV. 30

(DESIGN; *ELECTRONIC SCANNERS FOR ELECTROMAGNETIC WAVES; POLARIZATION; TRACKING WITH S BAND; CONICAL ANTENNAS.) (X BAND; *RADAR TRACKING BY FERRITES; ROTATING STRUCTURES; TESTS ON RADAR ANTENNAS; *RADAR SCANNING.)
ELECTRONIC DEFENSE LAB., MOUNTAIN VIEW, CALIF.
AD-273 731 2-2-6 DIV. 8

***ELECTRONS**

(*IONS; *THRUST AUGMENTOR NOZZLES; TESTS; *ELECTRONS.) (ROCKET MOTOR; PRESSURE; TEMPERATURE; MEASUREMENT.) (*SPECTROGRAPHIC ANALYSIS; OPTICS; DETECTION; BLACKBODY RADIATION.) (*GAS FLOW; *PLASMA PHYSICS.) (NUMERICAL ANALYSIS; INTEGRAL EQUATIONS.)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 940 62-2-6 DIV. 20

(*ELECTRONS; GASES; POTENTIAL THEORY; *ELECTRON TRANSITIONS; *NUCLEAR ENERGY LEVELS.) (NUCLEI; STATISTICAL ANALYSIS.)
WEIZMANN INST. (ISRAEL).
AD-273 697 2-2-6 DIV. 25

(*ELECTRONS; DENSITY IN *METALS AND *GASES.) (WAVE ANALYSIS; *QUANTUM MECHANICS; NUCLEAR SPINS; ATOMIC ORBITALS; LATTICES; THEORY.)
SHEFFIELD U. (GT. BRIT.).
AD-273 793 62-2-6 DIV. 25

***ELECTROPLATING**

(*ELECTROPLATING; *TUNGSTEN; ORGANIC COMPOUNDS; ELECTROLYTES; ACIDS; SOLUTIONS.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 889 62-2-6 DIV. 17

***EMBEDDING SUBSTANCES**

(HYPERVELOCITY GUNS; TELEMETERING; RADIO; PACKAGING; *EMBEDDING SUBSTANCES; THERMOSETTING RESINS; *EPOXY RESINS; MANUFACTURING METHODS; AGING; DENSITY; TESTS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 681 62-2-6 DIV. 14

***EPOXIDES**

(*HEAT RESISTANT POLYMERS; *EPOXY RESINS; *EPOXIDES; POLYCYCLIC COMPOUNDS; HEPTANES; OCTANES; SYNTHESIS; AGING.) (*AIRCRAFT FINISHES; TRANSPARENT PANELS; OPTICAL COATINGS FOR AIRCRAFT; SUPERSONICS; SUPERSONIC PLANES.)
MIDWEST RESEARCH INST., KANSAS CITY, MO.
AD-273 558 62-2-6 DIV. 14

***EPOXY RESINS**

(*HEAT RESISTANT POLYMERS; *EPOXY RESINS; *EPOXIDES; POLYCYCLIC COMPOUNDS; HEPTANES; OCTANES; SYNTHESIS; AGING.) (*AIRCRAFT FINISHES; TRANSPARENT PANELS; OPTICAL COATINGS FOR AIRCRAFT; SUPERSONICS; SUPERSONIC PLANES.)
MIDWEST RESEARCH INST., KANSAS CITY, MO.
AD-273 558 62-2-6 DIV. 14

(HYPERVELOCITY GUNS; TELEMETERING; RADIO; PACKAGING; *EMBEDDING SUBSTANCES; THERMOSETTING RESINS; *EPOXY RESINS; MANUFACTURING METHODS; AGING; DENSITY; TESTS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 681 62-2-6 DIV. 14

***ERRORS**

(*SINGLE CRYSTALS; *X-RAY DIFFRACTION ANALYSIS; CRYSTAL STRUCTURE; GONIOMETERS.) (*DATA PROCESSING SYSTEMS; COMPUTERS; *PROGRAMMING; PUNCHED CARD METHODS.) (CAMERAS; PHOTOGRAPHS BY REFLECTION.) (ERRORS; ANALYSIS.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 719 2-2-6 DIV. 30

***ESTERS**

(*POLYMERS; RESINS; ION EXCHANGE RESINS; *ESTERS; *AMIDES; ORGANIC ACIDS; SYNTHESIS; CHEMICAL REACTIONS; REACTION KINETICS; HYDROLYSIS; IONS.) (HYDROXIDES; METHYL RADICALS; ANILINES; ACETYL RADICALS; AMINES; ETHYL RADICALS; HYDROGEN COMPOUNDS; PHTHALATES; CARBOXYLIC ACIDS; PHENYL RADICALS.) (ENZYMES; CHLORINESTERASE.)
POLYTECHNIC INST. OF BROOKLYN, N. Y.
AD-273 645 62-2-6 DIV. 14

***EXHAUST FLAMES**

(*NUCLEAR MAGNETIC RESONANCE IN EXHAUST GASES AND *EXHAUST FLAMES FROM JET ENGINES.) (THERMAL RADIATION *NUCLEAR SPINS; NUCLEAR STATES; QUANTUM MECHANICS; EXCITATION.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 756 62-2-6 DIV. 20

***EXPANDED PLASTICS**

(*FOAMS; *EXPANDED PLASTICS; POLYMERS; *URETHANES; MANUFACTURING METHODS; POWDERS; FREEZING; LOW PRESSURE RESEARCH; LOW TEMPERATURE RESEARCH.) (SATELLITE VEHICLES; SPACESHIPS; MATERIALS.) (CYANATES; HALOCARBONS; WATER.)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 874 62-2-6 DIV. 14

***EXPERIMENTAL DATA**

(FEASIBILITY STUDIES OF *PHYSICAL PROPERTIES OF *DIPOLE ANTENNAS.) (MEASUREMENT OF ADMITTANCE; ELECTRICAL CONDUCTANCE; ELECTROSTATIC CAPACITANCE; ELECTRIC CURRENTS.) (STORAGE TANKS; *LIQUIDS; WATER.) (*EXPERIMENTAL DATA; TABLES.)
GORDON MCKAY LAB. OF APPLIED SCIENCE, HARVARD U., CAMBRIDGE, MASS.
AD-273 687 62-2-6 DIV. 8

***EXPLOSIVES**

(DESIGN OF *EXPLOSIVES; *LIGHT SOURCES IN AN ARGON ATMOSPHERE FOR USE IN *SPARK SHADOWGRAPH PHOTOGRAPHY OF SUPERSONIC FLOW OF AIR THROUGH GLASS NOZZLES.) HIGH SPEED PHOTOGRAPHY.
NAVAL ORDNANCE TEST STATION; CHINA LAKE, CALIF.
AD-273 560 62-2-6 DIV. 22

***EXTRATERRESTRIAL BASES**

(*EXTRATERRESTRIAL BASES; MOON; EXPLORATION.) (VEHICLES; TRAFFICABILITY.) (TELEVISION CAMERAS; TELEVISION EQUIPMENT; TELEVISION GUIDANCE; TELEVISION DISPLAY SYSTEMS.) (*CAMERA TUBES; IMAGE TUBES; ICONOSCOPES; DESIGN.)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 818 62-2-6 DIV. 12

(*MOON, *EXTRATERRESTRIAL BASES.) (MOON; MOUNTAINS; VOLCANOES; CRATERS; ROCK; LAVA; VOLCANIC DUST; RILLES.) (MOON; GEOLOGY; MATERIALS.) (MOON; METEORITES.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 816 62-2-6 DIV. 2

***EXTRATERRESTRIAL RADIO WAVES**

(*MOON; RADIO SIGNALS; VERY HIGH FREQUENCY; RADIOFREQUENCY SPECTRUM ANALYZERS; ELECTROMAGNETIC WAVES; REFLECTION; *EXTRATERRESTRIAL RADIO WAVES; *RADIO ASTRONOMY; *AURORAE.) (*ECHO RANGING; DOPPLER SYSTEMS; PARABOLIC ANTENNAS; *IONOSPHERE; POLARIZATION.) (INSTRUMENTATION; OSCILLATORS; OSCILLATOR CIRCUITS; PARAMETRIC AMPLIFIER; RECORDING DEVICES.)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 686 62-2-6 DIV. 2

(*EXTRATERRESTRIAL RADIO WAVES; *ABSORPTION; IONOSPHERE; AURORAE; ARCTIC REGIONS.) (RADIO COMMUNICATION SYSTEMS; *SCATTERING; IONOSPHERE; ARCTIC REGIONS.)
PAGE COMMUNICATIONS ENGINEERS, INC., WASHINGTON, D. C.
AD-273 725 2-2-6 DIV. 2

***EXTREMELY LOW FREQUENCY**

(*MAGNETOHYDRODYNAMICS; *EXTREMELY LOW FREQUENCY; *ELECTROMAGNETIC WAVES; MAGNETIC FIELDS; OSCILLATIONS; CONDUCTIVITY; WAVES.) (*TERRESTRIAL MAGNETISM; *SOLAR DISTURBANCES; *FLUID FLOW.) (TRANSFORMATIONS (MATHEMATICS); PARTIAL DIFFERENTIAL EQUATIONS; PERTURBATION THEORY.)
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 492 62-2-6 DIV. 25

***FAILURE (MECHANICS)**

(METALS; *STEEL; SHEETS; *FAILURE (MECHANICS); *FRACTURE (MECHANICS); GRAINS (METALLURGY); THICKNESS; HEAT TREATMENT; TEMPERATURE.) (MECHANICAL PROPERTIES; TENSILE PROPERTIES.)
AUBURN RESEARCH FOUNDATION; ALABAMA POLYTECHNIC INST.
AD-273 672 62-2-6 DIV. 17

***FAST NEUTRONS**

(*THERMAL NEUTRONS; *FAST NEUTRONS; *DOSIMETERS; RADIOACTIVE FILMS; PHOTOGRAPHIC EMULSIONS; DETECTORS.) (*WATER BOILER REACTORS; GAMMA RAYS; GAMMA EMISSION; SENSITIVITY; PHOTONS.) (CADMIUM; LITHIUM; GOLD; FUELS.) (EXPERIMENTAL DATA.
NUCLEAR DEFENSE LAB.; ARMY CHEMICAL CENTER; MD.
AD-273 456 62-2-6 DIV. 20

***FATIGUE (MECHANICS)**

(*FATIGUE (MECHANICS); STEEL (4340); TENSILE PROPERTIES; TESTS; DATA.)
METALS; ALLOYS.
BELFOUR ENGINEERING CO.; SUTTONS BAY; MICH.
AD-273 689 62-2-6 DIV. 17

(*FATIGUE (MECHANICS); SOLIDS; *ELASTICITY; *PLASTICITY; *DEFORMATION; *SHEETS; STRESSES; SHEAR STRESSES; LOAD DISTRIBUTION; MATHEMATICAL ANALYSIS; EQUATIONS.)
MASSACHUSETTS INST. OF TECH.; CAMBRIDGE.
AD-273 832 62-2-6 DIV. 25

***FEEDBACK**

(STABILITY OF *FEEDBACK *CONTROL SYSTEMS.) (FEEDBACK SIGNALS; PULSE MODULATION; NONLINEAR SYSTEMS.) (OSCILLATORS; WAVE ANALYSIS.) (DATA; SAMPLING; FEEDBACK.)
ELECTRONICS RESEARCH LAB.; U. OF CALIF.; BERKELEY.
AD-273 858 62-2-6 DIV. 8

***FERRITES**

(*POWER AMPLIFIERS; SUPERHIGH FREQUENCY; *FERRITES; MAGNETIC FIELDS; POLARIZATION; MATHEMATICAL ANALYSIS; NONLINEAR DIFFERENTIAL EQUATIONS; LINEAR DIFFERENTIAL EQUATIONS.) (USSR; RADAR SIGNALS; RADIO SIGNALS; AMPLIFIERS.)
FOREIGN TECH. DIV; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
AD-273 882 62-2-6 DIV. 8

***FERROMAGNETIC MATERIALS**

(*FERROMAGNETIC MATERIALS; *NICKEL; PARTICLES IN SILICON COMPOUNDS; DIOXIDES; SINGLE CRYSTALS; SURFACES; IRON; *ADSORPTION OF *HYDROGEN; MAGNETIC PROPERTIES; FERROMAGNETISM; SPECTROGRAPHIC ANALYSIS; MICROWAVE SPECTROSCOPY; RADIOFREQUENCY; THEORY.) CATALYSTS.
VARIAN ASSOCIATES; PALO ALTO; CALIF.
AD-273 780 62-2-6 DIV. 25

***FERROMAGNETISM**

(*PARAMETRIC AMPLIFIERS; FERROMAGNETIC MATERIALS; *FERROMAGNETISM.) (AMPLIFIERS; THEORY.)
AEROSPACE CORP.; LOS ANGELES; CALIF.
AD-273 595 62-2-6 DIV. 8

***FILAMENT WOUND CONSTRUCTION**

(*MANUFACTURING METHODS; PROCESSING; *FILAMENT WOUND CONSTRUCTION; MATERIALS; DESIGN; CASTING; TEST METHODS; WIRE WINDING MACHINES.) (WATER; SOLUBILITY; SAND; SILICON COMPOUNDS; CALCIUM COMPOUNDS; OXIDES; INORGANIC SUBSTANCES; CARBOHYDRATES.) (METALS; ALUMINUM; STRUCTURES.) (HEAT TREATMENT; DEFORMATION; STRESSES; MECHANICAL PROPERTIES; PHYSICAL PROPERTIES.) PRESSURE VESSELS; ROCKET CASES.
ROCKETDYNE; CANOGA PARK; CALIF.
AD-273 517 62-2-6 DIV. 26

***FILMS**

(LIQUIDS; *FILMS; CONDENSATION AND *HEAT TRANSFER IN METAL PLATES; SHEETS; MATHEMATICAL ANALYSIS BY *LAMINAR BOUNDARY LAYER; EQUATIONS OF STATE; FLUID MECHANICS; FLUID FLOW.)
AEROSPACE CORP.; LOS ANGELES; CALIF.
AD-273 592 62-2-6 DIV. 25

***FLAME PROPAGATION**

(*REACTION KINETICS; CHEMICAL REACTIONS; COMBUSTION; MIXTURES; *HYDROCARBONS; *OXYGEN; *NITROGEN; *FLAMES.) (ENERGY; CHEMICAL BONDS; *FLAME PROPAGATION; TEMPERATURE.) (BUTANES; PENTANES.) ETHYLENE OXIDE; FUELS.
LOUVAIN U. (BELGIUM).
AD-273 629 62-2-6 DIV. 10

***FLAMES**

(*REACTION KINETICS; CHEMICAL REACTIONS; COMBUSTION; MIXTURES; *HYDROCARBONS; *OXYGEN; *NITROGEN; *FLAMES.) (ENERGY; CHEMICAL BONDS; *FLAME PROPAGATION; TEMPERATURE.) (BUTANES; PENTANES.) ETHYLENE OXIDE; FUELS.
LOUVAIN U. (BELGIUM).
AD-273 629 62-2-6 DIV. 10

(*INTERFEROMETERS; *PHOTOGRAPHIC ANALYSIS OF IGNITION AND DETONATION OF GASES.) (*MIXTURES OF HYDROGEN AND OXYGEN.) (ACCELERATION OF *FLAMES IN EXPLOSIVE GASES.)
CALIFORNIA U.; BERKELEY.
AD-273 684 62-2-6 DIV. 10

***FLIGHT SIMULATORS**

(*FLIGHT SIMULATORS; TRAINING DEVICES; EFFECTIVENESS.) (GROUP DYNAMICS; MEASUREMENT; PILOTS; NAVIGATORS.)
AMERICAN INST. FOR RESEARCH; PITTSBURGH; PA.
AD-273 891 62-2-6 DIV. 23

***FLUID FLOW**

(THEORY; BOUNDARY LAYER; *FLUID FLOW; *SHEAR STRESSES ALONG CYLINDRICAL BODIES.) (*DRAG; TURBULENCE; LAMINAR BOUNDARY LAYER; FLUID MECHANICS; VISCOSITY.) (TOWING CABLES; *HYDRODYNAMICS; TESTS.)
TEXAS A. AND M. COLL.; COLLEGE STATION.
AD-273 562 62-2-6 DIV. 9

***FLUORIDES**

(*SINGLE CRYSTALS; CRYSTALS; *LITHIUM COMPOUNDS; *FLUORIDES; GROWTH; DETERIORATION; CORROSION; SOLUTIONS; CORROSIVE LIQUIDS; FATTY ACIDS; STEARIC ACIDS; CHEMICAL MILLING.)
RIAS; INC.; BALTIMORE; MD.
AD-273 647 62-2-6 DIV. 25

(ABSORPTION OF *INFRARED RADIATION BY GASES.) (*FLUORIDES; HYDROGEN COMPOUNDS.) (INFRARED SPECTROSCOPY; PRESSURE; ELECTRON TRANSITIONS.) THESES.
TENNESSEE U.; KNOXVILLE.
AD-273 851 62-2-6 DIV. 25

***FLUORSPAR**

(*PARAMAGNETIC RESONANCE OF RARE EARTHS; IONS IN CRYSTAL STRUCTURE OF *NEODYMIUM AND *URANIUM; ISOTOPES IN *FLUORSPAR.) (*HYPERFINE STRUCTURE; ATOMIC SPECTRUM; MOLECULAR ROTATION.) (THERMAL DIFFUSION; TRANSPORT PROPERTIES.)
HEBREW U. (ISRAEL).
AD-273 497 62-2-6 DIV. 25

***FOAMS**

(*FOAMS; *EXPANDED PLASTICS; POLYMERS; *URETHANES; MANUFACTURING METHODS; POWDERS; FREEZING; LOW PRESSURE RESEARCH; LOW TEMPERATURE RESEARCH.) (SATELLITE VEHICLES; SPACESHIPS; MATERIALS.) CYANATES; HALOCARBONS; WATER.
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB.; NAVAL AIR DEVELOPMENT CENTER; JOHNSVILLE; PA.
AD-273 874 62-2-6 DIV. 14

***FORGING**

(MANUFACTURING METHODS; *FORGING; *NIOBIUM ALLOYS (CB74); TUNGSTEN ALLOYS; ZIRCONIUM ALLOYS; CASTING; EXTRUSION.) (PROCESSING; POWDER ALLOYS; POWDER METALLURGY; MELTING; ELECTRON BEAMS; ELECTRIC ARCS; VACUUM FURNACES; SHEETS.) TEST METHODS; TENSILE PROPERTIES; STRESSES; RUPTURE; ALLOYS.
CRUCIBLE STEEL CO. OF AMERICA; MIDLAND; PA.
AD-273 542 62-2-6 DIV. 26

(MANUFACTURING METHODS; *FORGING; *NIOBIUM ALLOYS (CB74); TUNGSTEN ALLOYS; ZIRCONIUM ALLOYS; TEMPERATURE; DIES; REFRACTORY COATINGS; OXIDATION INHIBITORS; ALUMINUM COMPOUNDS; CHROMIUM COMPOUNDS; SILICON COATINGS.) (EXTRUSION; HEAT TREATMENT; DEFORMATION.) (HIGH TEMPERATURE RESEARCH; TENSILE PROPERTIES; STRESSES; RUPTURE.) NONDESTRUCTIVE TESTING; ULTRASONICS; CRYSTAL STRUCTURES; HARDNESS; CRYSTALLIZATION; MICROSTRUCTURE; SURFACE PROPERTIES.
CRUCIBLE STEEL CO. OF AMERICA; MIDLAND; PA.
AD-273 543 62-2-6 DIV. 26

***FRACTURE (MECHANICS)**

(METALS; *STEEL; SHEETS; *FAILURE (MECHANICS); *FRACTURE (MECHANICS); GRAINS (METALLURGY); THICKNESS; HEAT TREATMENT; TEMPERATURE.) (MECHANICAL PROPERTIES; TENSILE PROPERTIES.)
AUBURN RESEARCH FOUNDATION; ALABAMA POLYTECHNIC INST.
AD-273 672 62-2-6 DIV. 17

(ALLOYS; SHEETS; *NICKEL ALLOYS (AISI 4340); CHROMIUM ALLOYS; MANGANESE ALLOYS; COBALT ALLOYS; MANUFACTURING METHODS; PROCESSING; HEAT TREATMENT; AUSTENITE.) (TESTS; MECHANICAL PROPERTIES; TENSILE PROPERTIES; HARDNESS; IMPACT SHOCK; *FRACTURE (MECHANICS); DEFORMATION; GRAINS (METALLURGY); MICROSTRUCTURE; *METALLURGICAL ANALYSIS.)
MASSACHUSETTS INST. OF TECH.; CAMBRIDGE.
AD-273 705 2-2-6 DIV. 17

(*ROCKET CASES; MATERIALS; *SHEETS; *TITANIUM ALLOYS-BASE; ALUMINUM ALLOYS; CHROMIUM ALLOYS; VANADIUM ALLOYS; *WELDS; *FRACTURE (MECHANICS); HEAT TREATMENT; CRYSTAL STRUCTURE; MICROSTRUCTURE; AGING; HARDNESS; DATA.)
NAVAL WEAPONS LAB.; DAHLGREN; VA.
AD-273 711 2-2-6 DIV. 17

***FRICTION**

(*SOLIDS; SURFACES; *FRICTION; VELOCITY; TEMPERATURE; TEST EQUIPMENT; TEST METHODS.) (STEEL; ZINC; TUNGSTEN COMPOUNDS; CARBIDES; TIN; CAST IRON; BRASS; COPPER; ALUMINUM; LEAD; CHROMIUM; LOAD DISTRIBUTION; LOADING; HEAT TRANSFER; EROSION; METALS; BEARINGS.)
UTAH U. COLL. OF ENGINEERING; SALT LAKE CITY.
AD-273 789 62-2-6 DIV. 25

***FUEL CELLS**

(*FUEL CELLS; *ALKALINE CELLS; *ELECTROLYTIC CELLS; FUELS; HYDRAZINES; FORMALDEHYDE; AMMONIA; NICKEL ELECTRODES; PLATINUM; ANODES (ELECTROLYTIC CELL); CATHODES (ELECTROLYTIC CELL); ELECTROCHEMISTRY; DESIGN.) PRIMARY BATTERIES; STORAGE BATTERIES.
LOCKHEED AIRCRAFT CORP.; SUNNYVALE; CALIF.
AD-273 702 2-2-6 DIV. 7

(*ELECTRIC POWER PRODUCTION; *POWER SUPPLIES; *THERMOELECTRICITY; *THERMIONIC EMISSION; *FUEL CELLS; GENERATORS; *VOLTAGE REGULATORS; SWITCHING CIRCUITS; CONTROL SYSTEMS; INVERTED RECTIFIERS; TRANSISTORS; RECTIFIERS; STABILITY; DESIGN.) (POWER SUPPLIES; SOURCES; VOLTAGE; IMPEDANCE; ELECTRONIC CIRCUITS; SEMICONDUCTORS; TESTS.)
GENERAL ELECTRIC CO.; WEST LYNN; MASS.
AD-273 869 62-2-6 DIV. 7

***FUEL PUMPS**

(*JET PUMPS; *FUEL PUMPS; LIQUID ROCKET PROPELLANTS; FLUID FLOW IN FUEL SYSTEMS; ROCKET MOTORS; COMBUSTION CHAMBERS; CONFIGURATION; DESIGN; EFFECTIVENESS.) (GAS GENERATING SYSTEMS; GAS FLOW.)
JET PROPULSION CENTER; PURDUE U.; LAFAYETTE; IND.
AD-273 836 62-2-6 DIV. 27

***FUEL SPRAYS**

(*FUEL SPRAYS INTO *TURBULENT FLOW; *COMBUSTION OF BENZENES; JET MIXING FLOW; SPECTROGRAPHIC ANALYSIS; CHEMICAL ANALYSIS; MEASUREMENT.)
FOREIGN TECH. DIV.; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
AD-273 886 62-2-6 DIV. 10

***FUNCTIONAL ANALYSIS**

(*ALGEBRAIC TOPOLOGY; GROUPS (MATHEMATICS); *FUNCTIONAL ANALYSIS; TRANSFORMATIONS (MATHEMATICS); SEQUENCES; SCHEDULING; *SPHERES.)
INSTITUTE OF MATHEMATICAL SCIENCES; NEW YORK U.; N. Y.
AD-273 484 62-2-6 DIV. 15

***FUNCTIONS**

HANDBOOKS OF *BLACKBODY RADIATION; *FUNCTIONS; *TABLES.
NAVAL ORDNANCE TEST STATION; CHINA LAKE; CALIF.
AD-273 559 62-2-6 DIV. 25

***GALLIUM COMPOUNDS**

(HIGH TEMPERATURE RESEARCH; *SEMICONDUCTORS; *GALLIUM COMPOUNDS; *ARSENIDES; *PHOSPHIDES; INTERMETALLIC COMPOUNDS.) (CRYSTALS; GROWTH; CRYSTALLIZATION; PRESSURE; ELECTRICAL PROPERTIES; RESISTANCE.) (TRANSPORT PROPERTIES; ARSENIC; VAPORS; CHEMICAL IMPURITIES; CARBON.)
DAVID SARNOFF RESEARCH CENTER; PRINCETON; N. J.
AD-273 845 62-2-6 DIV. 25

***GALVANOMETERS**

(*GALVANOMETERS; *DAMPING OF VIBRATION.) (FREQUENCY OF VIBRATION; LINEAR SYSTEMS; TABLES; VIBRATION; FREQUENCY.)
DAVID TAYLOR MODEL BASIN; *WASHINGTON; D. C.
AD-273 734 2-2-6 DIV. 7

***GAMMA RAYS**

(*DIGITAL COMPUTERS; *PROGRAMMING OF *SHIELDING; PENETRATION OF *GAMMA RAY; *NEUTRON SPECTRUM FROM LEAKAGE OF *RESEARCH REACTORS.)
GENERAL DYNAMICS/FORT WORTH; TEX.
AD-273 498 62-2-6 DIV. 30

***GAS DISCHARGES**

(*HIGH FREQUENCY; *PLASMA OSCILLATIONS OF ELECTRONS; LOW PRESSURE RESEARCH IN *GAS DISCHARGES.) (*ELECTRON BEAMS; SCATTERING; EXCITATION.) (*DISCHARGE TUBES; CATHODES; AMPLIFIERS; ELECTRODES; OSCILLOSCOPE PROBES; RADIO RECEIVERS.) USSR.
FOREIGN TECH. DIV.; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
AD-273 884 62-2-6 DIV. 25

***GAS FLOW**

(*IONS; *THRUST AUGMENTOR NOZZLES; TESTS; *ELECTRONS.) (ROCKET MOTOR; PRESSURE; TEMPERATURE; MEASUREMENT.) (*SPECTROGRAPHIC ANALYSIS; OPTICS; DETECTIONS; BLACKBODY RADIATION.) (*GAS FLOW; *PLASMA PHYSICS.) (NUMERICAL ANALYSIS; INTEGRAL EQUATIONS.)
BENDIX SYSTEMS DIV.; BENDIX CORP.; ANN ARBOR; MICH.
AD-273 940 62-2-6 DIV. 20

(*WIND TUNNELS; *SUPERSONIC WIND TUNNELS; HIGH TEMPERATURE RESEARCH; SIMULATION OF *GAS FLOW OF AIR BY EXHAUST GASES; THERMODYNAMICS; MATHEMATICAL ANALYSIS; TESTS.) (AERODYNAMICS; HEAT TRANSFER; AERODYNAMIC HEATING; TEST METHODS; TEST FACILITIES.) (*HYDROCARBONS AFTER COMBUSTION WITH ARGON; HELIUM; OXYGEN; PHYSICAL PROPERTIES.) (PIPES; GAS FLOW; DRAG; HEAT TRANSFER; MATHEMATICAL ANALYSIS; TESTS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 678 62-2-6 DIV. 9

(*LOW TEMPERATURE RESEARCH ON *PLASMA JETS.) (RESEARCH PROGRAM ADMINISTRATION; *ABSTRACTING OF SCIENTIFIC RESEARCH RELATED TO EXPERIMENTAL DATA AND THEORY OF ENERGY; *TRANSPORT PROPERTIES AND IONIZATION OF *GAS FLOW.) BIBLIOGRAPHY.
AEROCHEM RESEARCH LABS.; INC.; PRINCETON; N. J.
AD-273 889 62-2-6 DIV. 25

***GAS GENERATING SYSTEMS**

(COMBUSTION CHAMBERS; COMBUSTION CHAMBER GASES; WATER; *STEAM.) (ROCKET MOTORS; EXHAUST GASES; JET MIXING FLOW; STEAM.) (*ROCKET LABORATORIES; INSTRUMENTATION; SPECIFIC IMPULSE.) *GAS GENERATING SYSTEMS.
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 688 62-2-6 DIV. 25

***GAS TURBINE ROTORS**

(*MAGNETOHYDRODYNAMICS; *GENERATORS; ELECTROMAGNETIC FIELDS IN ROTATION.) (*ELECTRICAL EQUIPMENT; ELECTRIC MOTORS; TURBINES; *GAS TURBINE ROTORS.) (HYDRODYNAMICS OF EQUATIONS; MOTION; PARTIAL DIFFERENTIAL EQUATIONS.) USSR.
FOREIGN TECH. DIV.; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
AD-273 885 62-2-6 DIV. 25

***GASES**

(*ELECTRONS; DENSITY IN *METALS AND *GASES.) (WAVE ANALYSIS; *QUANTUM MECHANICS; NUCLEAR SPINS; ATOMIC ORBITALS; LATTICES; THEORY.)
SHEFFIELD U. (GT. BRIT.).
AD-273 793 62-2-6 DIV. 25

***GENERATORS**

(*POWER SUPPLIES; *ELECTRIC POWER PRODUCTION; DIRECT CURRENT; ELECTRONIC EQUIPMENT; ELECTRICAL EQUIPMENT FOR FLOATING BODIES IN THE OCEANS.) (FUEL CELLS; DRY CELLS; STORAGE BATTERIES; THERMOELECTRICITY; LIQUEFIED GASES; *GENERATORS; INTERNAL COMBUSTION ENGINES; COSTS; RELIABILITY; DESIGN FOR NAVAL EQUIPMENT.)
KAYE, JOSEPH, AND CO., INC.; CAMBRIDGE; MASS.
AD-273 856 62-2-6 DIV. 7

(*POWER SUPPLIES; *ELECTRIC POWER PRODUCTION; DIRECT CURRENT; ELECTRONIC EQUIPMENT; ELECTRICAL EQUIPMENT FOR FLOATING BODIES IN THE OCEANS.) PRIMARY BATTERIES; STORAGE BATTERIES; SEA WATER BATTERIES; FUEL CELLS; MAGNETOHYDRODYNAMICS; SOLID STATE PHYSICS; SOLAR ENERGY; THERMOELECTRICITY; *GENERATORS.
KAYE; JOSEPH; AND CO.; INC.; CAMBRIDGE; MASS.
AD-273 857 62-2-6 DIV. 7

(*GENERATORS; *THERMOELECTRICITY; DESIGN.) HEAT TRANSFER; HEAT EXCHANGERS; COOLING; THERMOCOUPLES; THERMAL CONDUCTIVITY; ELECTRICAL PROPERTIES; ELECTRIC POWER PRODUCTION; POWER SUPPLIES; FUEL SYSTEMS; TESTS; TEST METHODS.
WESTINGHOUSE ELECTRIC CORP.; PITTSBURGH; PA.
AD-273 854 2-2-6 DIV. 7

(*MAGNETOHYDRODYNAMICS; *GENERATORS; ELECTROMAGNETIC FIELDS IN ROTATION.) (*ELECTRICAL EQUIPMENT; ELECTRIC MOTORS; TURBINES; *GAS TURBINE ROTORS.) (HYDRODYNAMICS OF EQUATIONS; MOTION; PARTIAL DIFFERENTIAL EQUATIONS.) USSR.
FOREIGN TECH. DIV.; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
AD-273 883 62-2-6 DIV. 25

***GEODETIC ASTRONOMY**

(*CELESTIAL MECHANICS; GEODESICS; *GEODETIC ASTRONOMY.) (*INERTIAL NAVIGATION; ORBITAL FLIGHT PATHS; SATELLITE VEHICLES; MOON; SOUNDING ROCKETS.) (EARTH; GRAVITY; RELATIVITY THEORY.) (TERRAIN; GEOPHYSICS; *GEODETIC DATA; GEOMETRY.) (COMPUTERS; ERRORS; ANALYSIS.) (TRANSFORMATIONS (MATHEMATICS); TAYLOR'S SERIES; FOURIER ANALYSIS; INTEGRAL EQUATIONS.) *BIBLIOGRAPHY.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; WASHINGTON; D. C.
AD-273 499 62-2-6 DIV. 2

***GEODETIC DATA**

(*CELESTIAL MECHANICS; GEODESICS; *GEODETIC ASTRONOMY.) (*INERTIAL NAVIGATION; ORBITAL FLIGHT PATHS; SATELLITE VEHICLES; MOON; SOUNDING ROCKETS.) (EARTH; GRAVITY; RELATIVITY THEORY.) (TERRAIN; GEOPHYSICS; *GEODETIC DATA; GEOMETRY.) (COMPUTERS; ERRORS; ANALYSIS.) (TRANSFORMATIONS (MATHEMATICS); TAYLOR'S SERIES; FOURIER ANALYSIS; INTEGRAL EQUATIONS.) *BIBLIOGRAPHY.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; WASHINGTON; D. C.
AD-273 499 62-2-6 DIV. 2

***GEOPHYSICAL PROSPECTING**

(SATELLITE VEHICLES; SOUNDING ROCKETS; HIGH ALTITUDE; METEOROLOGICAL BALLOONS; LUNAR PROBES; *GEOPHYSICAL EXPLORATIONS OF *UPPER ATMOSPHERE AND *SPACE ENVIRONMENTAL CONDITIONS.) (INSTRUMENTATION; TESTS.) (DENSITY; PRESSURE; TEMPERATURE; ULTRAVIOLET RADIATION; ELECTROMAGNETIC PROPERTIES; IONS; ELECTRONS; PLASMA PHYSICS; COSMIC RAYS; GAMMA RAYS; NOISE (RADIO); RADIOMETERS; GEODESICS; METEORITES; MOON; SURFACE PROPERTIES; METEOROLOGY; ATMOSPHERE MODELS.)
AIR FORCE CAMBRIDGE RESEARCH LABS.; BEDFORD; MASS.
AD-273 738 62-2-6 DIV. 2

***GEOPHYSICS**

(GEOLOGY; *GEOPHYSICS; EARTH; *DEFORMATION BY *NUCLEAR EXPLOSIONS IN SALTS; ROCK.) (*DETONATION WAVES; FRACTURE (MECHANICS); FRAGMENTATION OF TERRAIN.) (*AERIAL PHOTOGRAPHY; EXPERIMENTAL DATA.) NEW MEXICO.
STANFORD RESEARCH INST.; MENLO PARK; CALIF.
AD-273 519 62-2-6 DIV. 2

***GLASS TEXTILES**

(MATERIALS; *PHYSICAL PROPERTIES; THERMODYNAMICS; CORROSION; MECHANICAL PROPERTIES; TEST METHODS.) (*ABLATION; *COATINGS; ELECTRIC INSULATION; *GLASS TEXTILES; GRAPHITE; LAMINATES; ENCAPSULATION; EMBEDDING SUBSTANCES; *ZIRCONIUM COMPOUNDS; DIOXIDES.) (*STAINLESS STEEL (PH15-7MO); HONEYCOMB CORES; SANDWICH PANELS.) (*TOOL STEEL (HGR PUNCH AND DIE; OLYMPIC FM DIE, SELECT B DIE, JET FORGE TOOL; VASCO 7152 TOOL; CK SPECIAL TOOL); DIES.)
CHANCE VOUGHT CORP.; DALLAS; TEX.
AD-273 801 62-2-6 DIV. 14

***GOGGLES**

(*PROTECTIVE CLOTHING; *GOGGLES; ROCKET LAUNCHERS; SAFETY DEVICES.)
AMMUNITION GROUP; PICATINNY ARSENAL; DOVER; N. J.
AD-273 722 2-2-6 DIV. 29

***GRAPHITE**

(MATERIALS; *PHYSICAL PROPERTIES; THERMODYNAMICS; CORROSION; MECHANICAL PROPERTIES; TEST METHODS.) (*ABLATION; *COATINGS; ELECTRIC INSULATION; *GLASS TEXTILES; GRAPHITE; LAMINATES; ENCAPSULATION; EMBEDDING SUBSTANCES; *ZIRCONIUM COMPOUNDS; DIOXIDES.) (*STAINLESS STEEL (PH15-7MO); HONEYCOMB CORES; SANDWICH PANELS.) (*TOOL STEEL (HGR PUNCH AND DIE; OLYMPIC FM DIE, SELECT B DIE, JET FORGE TOOL; VASCO 7152 TOOL; CK SPECIAL TOOL); DIES.)
CHANCE VOUGHT CORP.; DALLAS; TEX.
AD-273 801 62-2-6 DIV. 14

***GROUND CONTROLLED APPROACH RADAR**

(*GROUND-CONTROLLED APPROACH RADAR; *AIRPORT RADAR SYSTEMS; AUTOMATIC PILOTS; *TRANSPORT PLANES; *RADAR NAVIGATION; AUTOMATIC; RELIABILITY; FLIGHT TESTING.) (RADAR SIGNALS; DATA PROCESSING SYSTEMS; DATA TRANSMISSION SYSTEMS; *RADIO NAVIGATION; TESTS.) (*ALL-WEATHER AVIATION; LANDING; INSTRUMENT LANDING; RADAR EQUIPMENT; RADIO EQUIPMENT.)
BELL AEROSYSTEMS CO.; BUFFALO; N. Y.
AD-273 538 62-2-6 DIV. 19

***GUIDED MISSILE NOSES**

(HEAT TRANSFER; TEMPERATURE; AERODYNAMIC HEATING; RE-ENTRY VEHICLES; BLUNT BODIES; *HEMISPHERICAL SHELLS; *GUIDED MISSILE NOSES; WIND TUNNEL MODELS IN HYPERSONICS.) (THEORY; MATHEMATICAL PREDICTION; MODEL TESTS.)
POLYTECHNIC INST. OF BROOKLYN; N. Y.
AD-273 837 62-2-6 DIV. 9

(*CERAMIC MATERIALS; *SILICON COMPOUNDS; DIOXIDES; PROCESSING OF *RADOMES BY PRESSURE CASTING AND IMPREGNATION WITH ALUMINUM COMPOUNDS; CHLORIDES; POROSITY; MECHANICAL PROPERTIES.) (*GUIDED MISSILE NOSES; MANUFACTURING METHODS.)
GEORGIA INST. OF TECH. ENGINEERING EXPERIMENT STATION; ATLANTA.
AD-273 893 62-2-6 DIV. 14

***GUIDED MISSILE TRACKING SYSTEMS**

(RE-ENTRY VEHICLES; *OPTICAL TRACKING; *INFRARED TRACKING; SHIPBORNE.) (*ATMOSPHERE; SKY BRIGHTNESS; SOLAR ENERGY; BLACKBODY RADIATION; DENSITY; ABSORPTION; SCATTERING; *ATTENUATION; *WAVE TRANSMISSION; MEASUREMENT; OPTICAL ANALYSIS.) (ATMOSPHERE MODELS; INSTRUMENTATION.) *GUIDED MISSILE TRACKING SYSTEMS.
BARNES ENGINEERING CO.; STAMFORD; CONN.
AD-273 812 62-2-6 DIV. 6

***GUIDED MISSILES**

(*SATELLITE VEHICLES; *GUIDED MISSILES; SURFACE TO SURFACE; RADAR TRACKING; RADIO INTERFEROMETERS; *TRACKING.) (*PLASMA PHYSICS; *ELECTROMAGNETIC FIELDS; WAVE TRANSMISSION; ELECTROMAGNETIC WAVES; MAGNETOHYDRODYNAMICS; *IONOSPHERIC DISTURBANCES; IONS; IONOSPHERE; UPPER ATMOSPHERE; *RADIO ASTRONOMY; RADIO WAVES; EXTRATERRESTRIAL RADIO WAVES; ANTENNA RADIATION PATTERNS; USSR.
AEROSPACE INFORMATION DIV.; WASHINGTON; D. C.
AD-273 937 62-2-6 DIV. 12

(*GUIDED MISSILES; SURFACE TO SURFACE; *COMMUNICATION SYSTEMS; *COMMUNICATION EQUIPMENT; INSTALLATION IN MILITARY FACILITIES; QUALITY CONTROL; SCHEDULING; GROUND SUPPORT EQUIPMENT.)
ITT KELLOGG; CHICAGO; ILL.
AD-273 700 2-2-6 DIV. 9

(*PHOTOGRAPHIC ANALYSIS OF *CAVITATION OBTAINED FROM MODEL TESTS OF THE WATER EXIT OF *GUIDED MISSILES.) (LAUNCHING; GUIDED MISSILES; UNDERWATER TO SURFACE.)
NAVAL ORDNANCE TEST STATION; CHINA LAKE; CALIF.
AD-273 717 2-2-6 DIV. 22

(LAUNCHING OF SHIPBORNE; SURFACE TO AIR; *GUIDED MISSILES FROM *CRUISERS.) (MEASUREMENT OF EXPLOSION DAMAGE FROM BOOSTER ROCKETS; LAUNCHING TO SHIP BULKHEADS; SHIP DECKS; PERSONNEL.) (GUIDED MISSILE PERSONNEL; *HAZARDS; *BLAST; BOOSTER ROCKETS.) (MEASUREMENT OF POISONOUS GASES; EXHAUST GASES; EXHAUST FLAMES; NOISE FROM BOOSTER ROCKETS.)
*NAVAL VESSELS.
NAVAL WEAPONS LAB.; DAHLGREN; VA.
AD-273 779 62-2-6 DIV. 12

(*RE-ENTRY VEHICLES; *GUIDED MISSILES; SURFACE TO SURFACE; GUIDED MISSILE TRAJECTORIES; OSCILLATION; GEOMETRY; MATHEMATICAL ANALYSIS; MEASUREMENT.) (*GUIDED MISSILE TRACKING SYSTEMS; RADAR TRACKING; ATMOSPHERE ENTRY.)
RCA DEFENSE ELECTRONIC PRODUCTS; MOORESTOWN; N. J.
AD-328 611 62-2-6 DIV.

***GUNS**

(DESIGN AND OPERATION OF *SMALL ARMS; *GUNS USED IN FIRING *BARRED WIRE FOR CONTROL OF PERSONNEL.) *WIRE; CONTAINERS; PACKAGING.
FRANKFORD ARSENAL; PHILADELPHIA; PA.
AD-273 834 62-2-6 DIV. 22

***GYROSCOPES**

(*GYROSCOPES; EQUATIONS OF MOTION.) USSR.
FOREIGN TECH. DIV.; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 883 62-2-6 DIV. 25

***HANDBOOKS**

(*HANDBOOKS; *LAMINATES; *PLASTICS; POLYMERS; ESTERS; REINFORCING MATERIALS; GLASS; *BONDING; ADHESIVES; RESIN ADHESIVES; *JOINTS; BOLTS; RIVETS; METAL SCREWS.) (LAMINATES; MECHANICAL PROPERTIES; TENSILE PROPERTIES; THICKNESS.) (INSTRUCTION MANUALS.
MATERIAL LAB.; NEW YORK NAVAL SHIPYARD; BROOKLYN.
AD-273 561 62-2-6 DIV. 14

(*LIQUID ROCKET PROPELLANTS; *ROCKET OXIDIZERS; ROCKET MOTORS; *SPECIFIC IMPULSE; MATHEMATICAL ANALYSIS.) (LIQUEFIED GASES; OXYGEN; NITROGEN COMPOUNDS; TETROXIDES; HYDRAZINES; METHYL HYDRAZINES; AMMONIA; CHLORIDES; PERCHLORYL RADICALS; FLUORINE; FLUORIDES; PENTABORANES; HYDROGEN; HYDROGEN COMPOUNDS; PERCHLORATES.) (*HANDBOOKS; TABLES.
AEROSPACE CORP.; EL SEGUNDO; CALIF.
AD-273 675 62-2-6 DIV. 10

(*ELASTOMERS; DESIGN; DATA; *HANDBOOKS; PROCESSING; CASTING; PLASTIC COATINGS; VULCANIZATION.) (MECHANICAL PROPERTIES; PHYSICAL PROPERTIES; THERMAL CONDUCTIVITY; ELECTRICAL PROPERTIES; AGING; HEAT; OXIDATION; OZONE.) (COMPATIBILITY WITH PETROLEUM; FUELS; LUBRICANTS; HYDRAULIC FLUIDS; LIQUID ROCKET PROPELLANTS; ROCKET OXIDIZERS; ROCKET FUELS.) (RADIATION EFFECTS; LOW PRESSURE RESEARCH; VIBRATION ISOLATORS; SEALS; SPRINGS.) (ELASTICITY; PLASTICITY; STRESSES; DEFORMATION; SHOCK RESISTANCE.) AIRFRAMES; SPACESHIPS; SATELLITE VEHICLES.
SOUTHWEST RESEARCH INST.; SAN ANTONIO; TEX.
AD-273 880 62-2-6 DIV. 14

***HARMONIC ANALYSIS**

INTERACTIONS BETWEEN *PLASMA OSCILLATIONS AND VELOCITY; MODULATION; *ELECTRON BEAMS.) (*HARMONIC ANALYSIS; BESSEL FUNCTIONS; PARTIAL DIFFERENTIAL EQUATIONS; NONLINEAR SYSTEMS.) (CATHODE RAY TUBES; KLYSTRONS; DIELECTRICS.)
MICROWAVE LAB.; STANFORD U.; CALIF.
AD-273 706 2-2-6 DIV. 25

***HAZARDS**

(LAUNCHING OF SHIPBORNE; SURFACE TO AIR; *GUIDED MISSILES FROM *CRUISERS.) (MEASUREMENT OF EXPLOSION DAMAGE FROM BOOSTER ROCKETS; LAUNCHING TO SHIP BULKHEADS; SHIP DECKS; PERSONNEL.) (GUIDED MISSILE PERSONNEL; *HAZARDS; *BLAST; BOOSTER ROCKETS.) (MEASUREMENT OF POISONOUS GASES; EXHAUST GASES; EXHAUST FLAMES; NOISE FROM BOOSTER ROCKETS.)
*NAVAL VESSELS.
NAVAL WEAPONS LAB.; DAHLGREN; VA.
AD-273 779 62-2-6 DIV. 12

***HEAT RESISTANT PAINTS**

(*HEAT RESISTANT PAINTS; PREPARATION FROM METALLIC COMPOUNDS; ZINC COMPOUNDS; OXIDES; METHYL RADICALS; HYDROGEN COMPOUNDS; PHOSPHITES; ETHYL RADICALS; PHOSPHATES; PROCESSING; AGING.) (*COATINGS FOR *METALS; ORGANIC COATINGS; CERAMIC COATINGS; PHOSPHATE COATINGS; ZIRCONATES; TITANATES; STANNATES.) (TESTS; RESISTANCE; TEMPERATURE; WATER; *WEATHERPROOFING; HARDNESS; BONDING; SURFACE PROPERTIES.)
SOUTHERN RESEARCH INST.; BIRMINGHAM; ALA.
AD-273 582 62-2-6 DIV. 14

(*HEAT RESISTANT PAINTS; PREPARATION FROM METALLIC COMPOUNDS; ZINC COMPOUNDS; OXIDES; METHYL RADICALS; HYDROGEN COMPOUNDS; PHOSPHITES; ETHYL RADICALS; PHOSPHATES.) (*COATINGS FOR *METALS; ORGANIC COATINGS; CERAMIC COATINGS; PHOSPHATE COATINGS; ZIRCONATES; TITANATES; STANNATES; TESTS; THICKNESS; HARDNESS; SURFACE PROPERTIES; BONDING; RESISTANCE; TEMPERATURE; WATER; WEATHERPROOFING.)
SOUTHERN RESEARCH INST.; BIRMINGHAM; ALA.
AD-273 583 62-2-6 DIV. 14

***HEAT RESISTANT POLYMERS**

(*HEAT RESISTANT POLYMERS; *EPOXY RESINS; *EPOXIDES; POLYCYCLIC COMPOUNDS; HEPTANES; OCTANES; SYNTHESIS; AGING.) (*AIRCRAFT FINISHES; TRANSPARENT PANELS; OPTICAL COATINGS FOR AIRCRAFT; SUPERSONICS; SUPERSONIC PLANES.)
MIDWEST RESEARCH INST.; KANSAS CITY; MO.
AD-273 586 62-2-6 DIV. 14

***HEAT TRANSFER**

(MEASUREMENT OF *HEAT TRANSFER BY *THERMAL RADIATION IN HYDROGEN; *HIGH TEMPERATURE RESEARCH.) (BLACKBODY RADIATION; ABSORPTION; *TRANSPORT PROPERTIES; ANALYSIS.) (DIGITAL COMPUTERS; PROGRAMMING FOR DENSITY; ENERGY; TEMPERATURE; PRESSURE.) (TAYLOR'S SERIES; INTEGRALS.)
UNITED AIRCRAFT CORP; EAST HARTFORD; CONN.
AD-273 467 62-2-6 DIV. 25

(HELIUM; HYDROGEN; NEON; NITROGEN; CARBON DIOXIDE; PLATINUM; TUNGSTEN; ENERGY; MOTION; *HEAT TRANSFER; *TEMPERATURE COEFFICIENT OF REACTIVITY.) (MOLECULES; *KINETIC THEORY; METALS; SURFACES.)
INSTITUTE OF ENGINEERING RESEARCH; U. OF CALIF.; BERKELEY.
AD-273 493 62-2-6 DIV. 25

(LIQUIDS; *FILMS; CONDENSATION AND *HEAT TRANSFER IN METAL PLATES; SHEETS; MATHEMATICAL ANALYSIS BY *LAMINAR BOUNDARY LAYER; EQUATIONS OF STATE; FLUID MECHANICS; FLUID FLOW.)
AEROSPACE CORP.; LOS ANGELES; CALIF.
AD-273 592 62-2-6 DIV. 25

***HELICOPTERS**

(*TARGETS; *DETECTION; IDENTIFICATION; AIR TO SURFACE.) (*HELICOPTERS; TARGET RECOGNITION; OPTICAL TARGET DESIGNATORS; PILOTS; AVIATION PERSONNEL.)
HUMAN ENGINEERING LABS.; ABERDEEN PROVING GROUND; MD.
AD-273 696 2-2-6 DIV. 6

***HEMISPHERICAL SHELLS**

(HEAT TRANSFER; TEMPERATURE; AERODYNAMIC HEATING; RE-ENTRY VEHICLES; BLUNT BODIES; *HEMISPHERICAL SHELLS; *GUIDED MISSILE NOSES; WIND TUNNEL MODELS IN HYPERSONICS.) (THEORY; MATHEMATICAL PREDICTION; MODEL TESTS.)
POLYTECHNIC INST. OF BROOKLYN; N. Y.
AD-273 837 62-2-6 DIV. 9

***HIGH FREQUENCY**

(*HIGH FREQUENCY; *PLASMA OSCILLATIONS OF ELECTRONS; LOW PRESSURE RESEARCH IN *GAS DISCHARGES.) (*ELECTRON BEAMS; SCATTERING; EXCITATION.) (*DISCHARGE TUBES; CATHODES; AMPLIFIERS; ELECTRODES; OSCILLOSCOPE PROBES; RADIO RECEIVERS.) USSR.
FOREIGN TECH. DIV.; AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
AD-273 884 62-2-6 DIV. 25

***HIGH TEMPERATURE RESEARCH**

(MEASUREMENT OF *HEAT TRANSFER BY *THERMAL RADIATION IN HYDROGEN; *HIGH TEMPERATURE RESEARCH.) (BLACKBODY RADIATION; ABSORPTION; *TRANSPORT PROPERTIES; ANALYSIS.) (DIGITAL COMPUTERS; PROGRAMMING FOR DENSITY; ENERGY; TEMPERATURE; PRESSURE.) (TAYLOR'S SERIES; INTEGRALS.)
UNITED AIRCRAFT CORP; EAST HARTFORD; CONN.
AD-273 467 62-2-6 DIV. 25

***HYDROCARBONS**

(*REACTION KINETICS; CHEMICAL REACTIONS; COMBUSTION; MIXTURES; *HYDROCARBONS; *OXYGEN; *NITROGEN; *FLAMES.) (ENERGY; CHEMICAL BONDS; *FLAME PROPAGATION; TEMPERATURE.) (BUTANES; PENTANES.) ETHYLENE OXIDE; FUELS.
LOUVAIN U. (BELGIUM).
AD-273 629 62-2-6 DIV. 10

(WIND TUNNELS; *SUPERSONIC WIND TUNNELS; HIGH TEMPERATURE RESEARCH; SIMULATION OF *GAS FLOW OF AIR BY EXHAUST GASES; THERMODYNAMICS; MATHEMATICAL ANALYSIS; TESTS.) (AERODYNAMICS; HEAT TRANSFER; AERODYNAMIC HEATING; TEST METHODS; TEST FACILITIES.) (*HYDROCARBONS AFTER COMBUSTION WITH ARGON; HELIUM; OXYGEN; PHYSICAL PROPERTIES.) (PIPES; GAS FLOW; DRAG; HEAT TRANSFER; MATHEMATICAL ANALYSIS; TESTS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 674 62-2-6 DIV. 9

***HYDRODYNAMICS**

(*HYDROFOIL BOATS; CAVITATION; CONSTRUCTION; DESIGN; TESTS.) (*HYDRODYNAMICS; HYDROFOILS; SHIP HULLS; ALUMINUM; CONTROL SYSTEMS; TRANSMISSIONS; GAS TURBINES; MARINE ENGINES; MARINE PROPELLERS; INSTRUMENTATION; GAS FLOW; MARINE ENGINEERING.)
GRUMMAN AIRCRAFT ENGINEERING CORP.; BETHPAGE; N. Y.
AD-273 590 62-2-6 DIV. 31

(THEORY; BOUNDARY LAYER; *FLUID FLOW; *SHEAR STRESSES ALONG CYLINDRICAL BODIES.) (*DRAG; TURBULENCE; LAMINAR BOUNDARY LAYER; FLUID MECHANICS; VISCOSITY.) (TOWING CABLES; *HYDRODYNAMICS; TESTS.)
TEXAS A. AND M. COLL.; COLLEGE STATION.
AD-273 562 62-2-6 DIV. 9

***HYDROFOIL BOATS**

(*HYDROFOIL BOATS; CAVITATION; CONSTRUCTION; DESIGN; TESTS.) (*HYDRODYNAMICS; HYDROFOILS; SHIP HULLS; ALUMINUM; CONTROL SYSTEMS; TRANSMISSIONS; GAS TURBINES; MARINE ENGINES; MARINE PROPELLERS; INSTRUMENTATION; GAS FLOW; MARINE ENGINEERING.)
GRUMMAN AIRCRAFT ENGINEERING CORP.; BETHPAGE; N. Y.
AD-273 590 62-2-6 DIV. 31

***HYDROGEN**

(*PHOTONUCLEAR REACTION; *PRODUCTION OF *POSITIVE PIONS FROM *HYDROGEN; NUCLEAR PHYSICS.) (MATRIX ALGEBRA; SCATTERING; BREMSSTRAHLUNG; SPECTROGRAPHIC ANALYSIS; MESONS.) (*POSITRONS; RADIOACTIVE DECAY; COUNTING METHODS; *PHOTOMULTIPLIERS.)
ILLINOIS U.; URBANA.
AD-273 699 62-2-6 DIV. 20

(*FERROMAGNETIC MATERIALS; *NICKEL; PARTICLES IN SILICON COMPOUNDS; DIOXIDES; SINGLE CRYSTALS; SURFACES; IRON; *ADSORPTION OF *HYDROGEN; MAGNETIC PROPERTIES; FERROMAGNETISM; SPECTROGRAPHIC ANALYSIS; MICROWAVE SPECTROSCOPY; RADIOFREQUENCY; THEORY.) CATALYSTS.
VARIAN ASSOCIATES; PALO ALTO; CALIF.
AD-273 750 62-2-6 DIV. 25

***HYDROSTATIC PRESSURE**

(DENSITY OF AIR IN *SATELLITE VEHICLES; ORBITAL FLIGHT PATHS; *DECELERATION; EQUATIONS.) (*HYDROSTATIC PRESSURE; GAS FLOW; PERTURBATION THEORY.) (FUNCTIONS; POLYNOMIALS; INTEGRAL EQUATIONS.)
AIR FORCE PROVING GROUND COMMAND; EGLIN AIR FORCE BASE; FLA.
AD-273 660 62-2-6 DIV. 12

***HYPERFINE STRUCTURE**

(*PARAMAGNETIC RESONANCE OF RARE EARTHS; IONS IN CRYSTAL STRUCTURE OF *NEODYMIUM AND *URANIUM; ISOTOPES IN *FLUORSPAR.) (*HYPERFINE STRUCTURE; ATOMIC SPECTRUM; MOLECULAR ROTATION.) (THERMAL DIFFUSION; TRANSPORT PROPERTIES.)
HEBREW U. (ISRAEL).
AD-273 697 62-2-6 DIV. 25

***HYPERVELOCITY GUNS**

(PROJECTILES; HYPERVELOCITY PROJECTILES; LAUNCHING; VELOCITY; USING HYDROGEN; PROPELLANTS IN *HYPERVELOCITY GUNS.) (INTERIOR BALLISTICS; VELOCITY; DETERMINATION; MATHEMATICAL ANALYSIS BY COMPUTERS.) (HYDROGEN; THERMODYNAMICS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION; TENN.
AD-273 538 62-2-6 DIV. 30

***HYPERVELOCITY PROJECTILES**

(TERMINAL BALLISTICS; *CRATERING; EFFECTS OF MYLAR; PLASTICS; COPPER AND ALUMINUM; *HYPERVELOCITY PROJECTILES AND DISC-SHAPED *PARTICLES ON LEAD; TARGETS.) (HYPERVELOCITY GUNS; INSTRUMENTATION FOR ACCELERATION OF PARTICLES.) HIGH-SPEED PHOTOGRAPHY; PHOTOGRAPHIC ANALYSIS; CAPACITORS.
TECHNICAL OPERATIONS, INC.; BURLINGTON; MASS.
AD-273 693 62-2-6 DIV. 22

(MICROWAVES; SCATTERING; *WAKES; HYPERVELOCITY PROJECTILES.) (BOUNDARY LAYER; TURBULENCE.) (TURBULENT FLOW; LAMINAR BOUNDARY LAYER.
GENERAL DYNAMICS/ASTRONAUTICS; SAN DIEGO; CALIF.
AD-273 617 62-2-6 DIV. 9

***HYPERVELOCITY VEHICLES**

(*HYPERVELOCITY VEHICLES; JET PLANES; HYPERSONICS; *STABILITY (LATERAL); STABILITY; OSCILLATION; ROLL; YAW; AMPING; STABILIZATION SYSTEMS; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; THEORY.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; WASHINGTON; D. C.
AD-273 568 62-2-6 DIV. 9

***ICONOSCOPES**

(*ICONOSCOPES; TELEVISION CAMERAS; *CAMERA TUBES; *INFRARED IMAGE TUBES; *INFRARED TELEVISION SYSTEMS; *TELEVISION GUIDANCE; *AERIAL RECONNAISSANCE; AIRBORNE; EFFECTIVENESS ANALYSIS.) (CAMERA TUBES; OPTICAL EQUIPMENT; INFRARED EQUIPMENT; SENSITIVITY; SIGNAL-TO-NOISE RATIO.) (SURFACE AREA; SURFACE TEMPERATURES; ILLUMINATION; BRIGHTNESS; INTENSITY; BLACKBODY RADIATION; MATHEMATICAL ANALYSIS.)
GENERAL ELECTRIC CO.; SANTA BARBARA; CALIF.
AD-273 814 62-2-6 DIV. 8

***INDUSTRIAL PRODUCTION**

(ROCKET MOTORS, SOLID ROCKET PROPELLANTS, *ROCKET CASES, *COUPLINGS, RINGS, PREPARATION, PROCESSING, PRODUCTION, DRAWING (MACHINE PROCESSING), FORGING, EXPLOSIVE FORMING, WELDING, MACHINING, EFFECTIVENESS OF *INDUSTRIAL PRODUCTION, RESEARCH PROGRAM ADMINISTRATION.)
65930 TEST GROUP (DEV) AIR FORCE SYSTEMS COMMAND, EDWARDS AIR FORCE BASE, CALIF.
AD-273 794 62-2-6 DIV. 27

***INERTIAL NAVIGATION**

(*CELESTIAL MECHANICS, GEODESICS, *GEODETIC ASTRONOMY,) (*INERTIAL NAVIGATION, ORBITAL FLIGHT PATHS, SATELLITE VEHICLES, MODA, SOUNDING ROCKETS,) (EARTH, GRAVITY, RELATIVITY THEORY,) (TERRAIN, GEOPHYSICS, *GEODETIC DATA, GEOMETRY,) (COMPUTERS, ERRORS, ANALYSIS,) (TRANSFORMATIONS (MATHEMATICS), TAYLOR'S SERIES, FOURIER ANALYSIS, INTEGRAL EQUATIONS,) *BIBLIOGRAPHY,
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 489 62-2-6 DIV. 2

***INFORMATION THEORY**

(*INFORMATION THEORY, *MEMORY DEVICES, DATA STORAGE SYSTEMS, DATA TRANSMISSION SYSTEMS,) (MAGNETIC TAPE, COMPUTERS, *DATA PROCESSING SYSTEMS, SWITCHING CIRCUITS, *COMPUTER LOGIC, SEQUENCES, CODING, PROBABILITY,) (TIME INTERVAL COUNTERS, ERRORS, ANALYSIS,) THESES,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 785 62-2-6 DIV. 30

***INFRARED IMAGE TUBES**

(*ICONOSCOPES, TELEVISION CAMERAS, *CAMERA TUBES, *INFRARED IMAGE TUBES, *INFRARED TELEVISION SYSTEMS, *TELEVISION GUIDANCE, *AERIAL RECONNAISSANCE, AIRBORNE, EFFECTIVENESS, ANALYSIS,) (CAMERA TUBES, OPTICAL EQUIPMENT, INFRARED EQUIPMENT, SENSITIVITY, SIGNAL-TO-NOISE RATIO,) (SURFACE AREA, SURFACE TEMPERATURES, ILLUMINATION, BRIGHTNESS, INTENSITY, BLACKBODY RADIATION, MATHEMATICAL ANALYSIS,)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 814 62-2-6 DIV. 8

***INFRARED RADIATION**

(*SOLAR SPECTRUM, *SCATTERING OF *INFRARED RADIATION IN ATMOSPHERE,) (ASTRONOMICAL OBSERVATORIES, TELESCOPES, MONOCHROMATIC LIGHT,) (AIR MASS ANALYSIS, PRECIPITATION, WATER,) ASTRONOMICAL DATA, ARIZONA,
ARIZONA STATE COLL., FLAGSTAFF,
AD-273 598 62-2-6 DIV. 2

(*SOLAR ATMOSPHERE, *INFRARED RADIATION, MICROWAVES, ULTRAVIOLET RADIATION, METEOROLOGY, SOLAR FLARES, *SOLAR SPECTRUM, ASTRONOMICAL OBSERVATORIES,) (RESEARCH PROGRAM ADMINISTRATION, SCIENTIFIC REPORTS,)
ARIZONA STATE COLL., FLAGSTAFF,
AD-273 699 62-2-6 DIV. 2

(*CRYOGENICS, FEASIBILITY STUDIES, *INFRARED RADIATION, *SOLAR ENERGY, *REFRIGERANT CONDENSERS, SHIELDING, VACUUM SYSTEMS, NITROGEN,) (INSTRUMENTATION, MEASUREMENT, VACUUM PUMPS, DESIGN, IONIZATION, GASES,) (HEAT TRANSFER, THERMAL DIFFUSION, ALUMINUM,)
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
AD-273 739 2-2-6 DIV. 25

(ABSORPTION OF *INFRARED RADIATION BY GASES,) (*FLUORIDES, HYDROGEN COMPOUNDS,) (INFRARED SPECTROSCOPY, PRESSURE, ELECTRON TRANSITIONS,) THESES,
TENNESSEE U., KNOXVILLE,
AD-273 831 62-2-6 DIV. 25

(*RE-ENTRY VEHICLES, *BLUNT BODIES, AERODYNAMIC HEATING, *RE-ENTRY AERODYNAMICS, AERODYNAMICS, HYPERSONICS, GAS IONIZATION, SHOCK WAVES, THERMAL RADIATION, *INFRARED RADIATION, MATHEMATICAL ANALYSIS, MEASUREMENT,) (NITROGEN, AIR, HEATING, INFRARED RADIATION,)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 885 62-2-6 DIV. 9

***INFRARED TELEVISION SYSTEMS**

(*ICONOSCOPES, TELEVISION CAMERAS, *CAMERA TUBES, *INFRARED IMAGE TUBES, *INFRARED TELEVISION SYSTEMS, *TELEVISION GUIDANCE, *AERIAL RECONNAISSANCE, AIRBORNE, EFFECTIVENESS, ANALYSIS,) (CAMERA TUBES, OPTICAL EQUIPMENT, INFRARED EQUIPMENT, SENSITIVITY, SIGNAL-TO-NOISE RATIO,) (SURFACE AREA, SURFACE TEMPERATURES, ILLUMINATION, BRIGHTNESS, INTENSITY, BLACKBODY RADIATION, MATHEMATICAL ANALYSIS,)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 814 62-2-6 DIV. 8

***INFRARED TRACKING**

(RE-ENTRY VEHICLES, *OPTICAL TRACKING, *INFRARED TRACKING, SHIPBORNE,)
(*ATMOSPHERE, SKY BRIGHTNESS, SOLAR ENERGY, BLACKBODY RADIATION, DENSITY, ABSORPTION, SCATTERING, *ATTENUATION, *WAVE TRANSMISSION, MEASUREMENT, OPTICAL ANALYSIS,) (ATMOSPHERE MODELS, INSTRUMENTATION,) *GUIDED MISSILE TRACKING SYSTEMS,
BARNES ENGINEERING CO., STAMFORD, CONN.
AD-273 612 62-2-6 DIV. 6

***INSTRUCTION MANUALS**

(*HANDBOOKS, *LAMINATES, *PLASTICS, POLYMERS, ESTERS, REINFORCING MATERIALS, GLASS, *BONDING, ADHESIVES, RESIN ADHESIVES, *JOINTS, BOLTS, RIVETS, METAL SCREWS,) (LAMINATES, MECHANICAL PROPERTIES, TENSILE PROPERTIES, THICKNESS,) *INSTRUCTION MANUALS,
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
AD-273 561 62-2-6 DIV. 14

***INSTRUMENTATION**

(METEOROLOGY, *METEOROLOGICAL RADAR, RADAR SIGNALS FOR *RADIOACTIVE FALL-OUT FROM *NUCLEAR EXPLOSIONS,) (*INSTRUMENTATION, METEOROLOGICAL DATA, STORMS, PRECIPITATION,) (DIGITAL COMPUTERS, DATA PROCESSING SYSTEMS, MAGNETIC TAPE,) RESEARCH PROGRAM ADMINISTRATION,
MASSACHUSETTS INST. OF TECH., CAMBRIDGE,
AD-273 451 62-2-6 DIV. 2

(MEASUREMENT, *ELECTRICAL CONDUCTANCE OF AIR, IONIZATION DURING *RE-ENTRY AERODYNAMICS,) (*INSTRUMENTATION, DESIGN OF SHOCK WAVES, *CONDUCTIVITY, *METERS FOR SATELLITE VEHICLES,) (CALIBRATION AND FLIGHT TESTING UNDER *SPACE ENVIRONMENTAL CONDITIONS,) (MAGNETOHYDRODYNAMICS, EXPERIMENTAL DATA, RELIABILITY,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 478 62-2-6 DIV. 9

(MEASUREMENT OF GAS FLOW BY SENSITIVITY OF *ELECTRICAL CONDUCTANCE, *INSTRUMENTATION, CALIBRATION,) (TRANSDUCERS, TESTS, STANDARDS OF *ABLATION, *MATERIALS, *ELECTRICAL PROPERTIES,) (*PLASMA JETS, GAS IONIZATION IN RE-ENTRY AERODYNAMICS,)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 501 62-2-6 DIV. 25

***INTERFERENCE**

(RADIOFREQUENCY, *INTERFERENCE IN *RADIATION COUNTERS, RECORDING DEVICES FROM *TELEMETERING TRANSMITTERS, TESTS, MEASUREMENT,) (TELEMETER SYSTEMS, *RADIO EQUIPMENT, TELEMETERING DATA, RADIOLOGICAL CONTAMINATION, ERRORS, RELIABILITY,)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 482 62-2-6 DIV. 20

***INTERFEROMETERS**

(*RADIO ASTRONOMY, *INTERFEROMETERS, *OPTICAL TRACKING OF *SATELLITE VEHICLES, SPACE FLIGHT,) (CALIBRATION, OPTICAL EQUIPMENT, RADIO SIGNALS, SIGNAL-TO-NOISE RATIO,) (ORBITAL FLIGHT PATHS OF GALAXIES, *STARS,) CELESTIAL MECHANICS,
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 488 62-2-6 DIV. 2

(*INTERFEROMETERS, *PHOTOGRAPHIC ANALYSIS OF IGNITION AND DETONATION OF GASES,) (*MIXTURES OF HYDROGEN AND OXYGEN,) (ACCELERATION OF *FLAMES IN EXPLOSIVE GASES,)
CALIFORNIA U., BERKELEY,
AD-273 688 62-2-6 DIV. 10

(*SPECTROGRAPHIC ANALYSIS, MOLECULAR SPECTROSCOPY, RARE GASES AND ELEMENTS,) (SPECTROGRAPHIC DATA, RECORDING DEVICES, *INTERFEROMETERS, TEMPERATURES, MEASUREMENT,) (*SODIUM AND *CESIUM, *CLOUDS IN THE *UPPER ATMOSPHERE,)
GEORGIA U., ATHENS,
AD-273 763 62-2-6 DIV. 25

(*INTERFEROMETERS, VERY HIGH FREQUENCY,) (*SOLAR DISTURBANCES, SOLAR NOISE, MEASUREMENT, RADIO SIGNALS, PHASE MEASUREMENT, POSITION FINDING,) *RADIO ASTRONOMY,
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 798 62-2-6 DIV. 3

***ION EXCHANGE RESINS**

(*ION EXCHANGE RESINS, CHEMICAL IMPURITIES, IONS, SODIUM, CALCIUM, THORIUM, NICKEL, ALUMINUM, PYROLYSIS, TEMPERATURE, CONDUCTIVITY, RESISTANCE, HALL EFFECT, PELLETS,) (*SEMICONDUCTORS, POLYMERS, THERMOELECTRICITY,)
PLASTICS LAB., PRINCETON U., N. J.
AD-273 736 2-2-6 DIV. 14

***IONIZATION**

(*IONIZATION OF CHEMICALS IN *ICNOSPHERE, CESIUM, VAPORS,) (SIMULATION OF *RECOMBINATION REACTIONRS,) (LABORATORIES, INSTRUMENTATION, MASS SPECTROMETERS, IONIZATION CHAMBERS, MICROWAVES,)
BIRMINGHAM U. (ST. BRIT.),
AD-273 613 62-2-6 DIV. 25

(*ELECTROMAGNETIC WAVES, PROPAGATION IN WEAKLY *IONIZATION (IONIZED) *AIR WITHIN MAGNETIC FIELDS,) (EXPERIMENTAL DATA, TABLES,) NUMERICAL ANALYSIS,
SPACE TECHNOLOGY LABS., INC., REDONDO BEACH, CALIF.
AD-273 830 62-2-6 DIV. 25

(*IONIZATION, *REACTION KINETICS, *DISSOCIATION, *RECOMBINATION REACTIONS,) (GAS IONIZATION, RARE GASES, MOLECULAR ASSOCIATION,) (MEASUREMENT OF IONIZATION BASED ON ELECTROSTATICS, MICROWAVES, MASS SPECTROMETERS,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 873 62-2-6 DIV. 20

***IONOSPHERE**

(*IONIZATION OF CHEMICALS IN *IONOSPHERE, CESIUM, VAPORS,) (SIMULATION OF *RECOMBINATION REACTIONRS,) (LABORATORIES, INSTRUMENTATION, MASS SPECTROMETERS, IONIZATION CHAMBERS, MICROWAVES,)
BIRMINGHAM U. (ST. BRIT.),
AD-273 613 62-2-6 DIV. 25

(*MOON, RADIO SIGNALS, VERY HIGH FREQUENCY, RADIOFREQUENCY SPECTRUM ANALYZERS, ELECTROMAGNETIC WAVES, REFLECTION, *EXTRATERRESTRIAL RADIO WAVES, *RADIO ASTRONOMY, *AURORAE,) (*ECHO RANGING, DOPPLER SYSTEMS, PARABOLIC ANTENNAS, *IONOSPHERE, POLARIZATION,) (INSTRUMENTATION, OSCILLATORS, OSCILLATOR CIRCUITS, PARAMETRIC AMPLIFIER, RECORDING DEVICES,)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 886 62-2-6 DIV. 2

(WAVE TRANSMISSION OF *VERY LOW FREQUENCY, ENERGY BETWEEN EARTH AND *IONOSPHERE, *ATMOSPHERICS,) (*RADIO RANGES AND *AZIMUTH OF RADIOFREQUENCY OSCILLATIONS, RADIOFREQUENCY SPECTRUM ANALYZERS,) (WAVEGUIDES, ANTENNAS, RADIO RECEIVERS, OSCILLOSCOPES, DELAY LINES, RADIOFREQUENCY AMPLIFIERS,) (ERRORS, MATHEMATICAL PREDICTION,)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 784 62-2-6 DIV. 25

(USSR, TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH,) (*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, LIFE EXPECTANCY, SPACE FLIGHT TO *MOON, MARS, VENUS, SUN,) (SPACESHIPS, DECELERATION, *RE-ENTRY AERODYNAMICS,) (*UPPER ATMOSPHERE, GEOPHYSICS, *IONOSPHERE,) (PHOTOGRAPHY OF MOON, VAN ALLEN RADIATION BELT,) (BIOLOGY, CONTROLLED ATMOSPHERES, *CLOSED-CYCLE ECOLOGICAL SYSTEMS, DOGS, MANNED, PILOTS, TRAINING, AVIATION SAFETY, GLOBAL FLIGHT,)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***IONOSPHERIC DISTURBANCES**

(*SATELLITE VEHICLES, *GUIDED MISSILES, SURFACE TO SURFACE, RADAR TRACKING, RADIO INTERFEROMETERS, *TRACKING,) *PLASMA PHYSICS, *ELECTROMAGNETIC FIELDS, *WAVE TRANSMISSION, ELECTROMAGNETIC WAVES, MAGNETOHYDRODYNAMICS, *IONOSPHERIC DISTURBANCES, IONS, IONOSPHERE, UPPER ATMOSPHERE, *RADIO ASTRONOMY, RADIO WAVES, EXTRATERRESTRIAL RADIO WAVES, ANTENNA RADIATION PATTERNS, USSR,
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 937 62-2-6 DIV. 12

***IONS**

(*IONS, *THRUST AUGMENTOR NOZZLES, TESTS, *ELECTRONS,) (ROCKET MOTOR, PRESSURE, TEMPERATURE, MEASUREMENT,) (*SPECTROGRAPHIC ANALYSIS, OPTICS, DETECTIONS, BLACKBODY RADIATION,) (*GAS FLOW, *PLASMA PHYSICS,) (NUMERICAL ANALYSIS, INTEGRAL EQUATIONS,)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 840 62-2-6 DIV. 20

***JET ENGINE NOISE**

(TESTS OF *ACOUSTIC INSULATION FOR JET FIGHTERS,) (EFFECTIVENESS AS SUPPRESSORS OF *JET ENGINE NOISE, SOUND TRANSMISSION, SOUND PRESSURE,) (ACOUSTIC INSULATION OF *TEST FACILITIES, BUILDINGS,)
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
AD-273 892 62-2-6 DIV. 30

***JET PLANE NOISE**

(CONICAL BODIES, *AIRPLANE NOSES FOR JET FIGHTERS, GLASS TEXTILES, AERODYNAMICS, TRANSONICS, SUPERSONICS, *JET PLANE NOISE, MEASUREMENT, MODEL TESTS, WIND TUNNEL MODELS,)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 734 62-2-6 DIV. 9

***JET PUMPS**

(*JET PUMPS; *FUEL PUMPS; LIQUID ROCKET PROPELLANTS; FLUID FLOW IN FUEL SYSTEMS; ROCKET MOTORS; COMBUSTION CHAMBERS; CONFIGURATION; DESIGN; EFFECTIVENESS.) (GAS GENERATING SYSTEMS; GAS FLOW.)
JET PROPULSION CENTER; PURDUE U., LAFAYETTE, IND.
AD-273 836 62-2-6 DIV. 27

(LIQUID JETS; JETS INTO DUCT INLETS TO *DIFFUSERS FOR *JET PUMPS; HYDRODYNAMICS; PRESSURE; TESTS; MATHEMATICAL ANALYSIS.) (JETS; AIR IN WATER.)
JET PROPULSION CENTER; PURDUE U., LAFAYETTE, IND.
AD-273 877 62-2-6 DIV. 9

***JETTISONABLE COCKPITS**

(FEASIBILITY STUDIES OF *JETTISONABLE COCKPITS FOR HIGH ALTITUDE EJECTION FROM SUPERSONIC PLANES.) (EJECTION SEATS; PRESSURE CAPSULES; DESIGN; CONFIGURATION; HUMAN ENGINEERING; AERODYNAMICS; VULNERABILITY; EFFECTIVENESS; DECELERATION; PARACHUTE DESCENTS; LANDING; AVIATION SAFETY; MILITARY REQUIREMENTS.)
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 625 62-2-6 DIV. 1

(DESIGN OF *JETTISONABLE COCKPITS; EJECTION SEATS FOR SUPERSONIC PLANES.) (*MODEL TESTS ON TRACKS (AERODYNAMICS); WIND TUNNEL MODELS.) (AERODYNAMIC CONFIGURATIONS; PRESSURE CAPSULES; HUMAN ENGINEERING; PARACHUTE DESCENTS; STABILIZATION SYSTEMS; RECOVERY; SEA RESCUES; *AVIATION SAFETY.) (TESTS; LIFT; DRAG; PITCH; MOMENTS; YAW; STABILITY; DATA; TABLES.) (EFFECTIVENESS OF TOWED BODIES WITH PNEUMATIC DEVICES FOR STABILIZATION.)
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 626 62-2-6 DIV. 1

***JOINTS**

(*HANDBOOKS; *LAMINATES; *PLASTICS; POLYMERS; ESTERS; REINFORCING MATERIALS; GLASS; *BONDING; ADHESIVES; RESIN ADHESIVES; *JOINTS; BOLTS; RIVETS; METAL SCREWS.) (LAMINATES; MECHANICAL PROPERTIES; TENSILE PROPERTIES; THICKNESS.) (*INSTRUCTION MANUALS; MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
AD-273 561 62-2-6 DIV. 14

***KINETIC THEORY**

(HELIUM; HYDROGEN; NEON; NITROGEN; CARBON DIOXIDE; PLATINUM; TUNGSTEN; ENERGY; MOTION; *HEAT TRANSFER; *TEMPERATURE COEFFICIENT OF REACTIVITY.) (MOLECULES; *KINETIC THEORY; METALS; SURFACES.)
INSTITUTE OF ENGINEERING RESEARCH; U. OF CALIF., BERKELEY.
AD-273 495 62-2-6 DIV. 25

***KLYSTRONS**

(FREQUENCY; CONTROL OF AN EXTREMELY HIGH FREQUENCY; *KLYSTRONS; *MICROWAVE OSCILLATORS.) (*RADAR TRANSMITTERS; MICROWAVE FREQUENCY, DESIGN; STABILIZATION SYSTEMS; PHASE STUDIES; STABILIZATION.)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 809 62-2-6 DIV. 8

(*ELECTRON BEAMS; *LINEAR SYSTEMS; ELECTRON TUBES; MICROWAVE FREQUENCY THEORY.) (ELECTRONIC CIRCUITS; ELECTRON BEAMS; ELECTRONS; INTERACTION.) (*KLYSTRONS; CAVITY RESONATORS; ELECTRON BEAMS; HARMONIC ANALYSIS; PLASMA PHYSICS; MAGNETIC FIELDS; MODULATION; PROPAGATION; SPACE CHARGES; MATHEMATICAL ANALYSIS.) MICROWAVE AMPLIFIERS; NONLINEAR SYSTEMS.)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 804 62-2-6 DIV. 8

(*ELECTRONIC CIRCUITS; ELECTRON BEAMS; INTERACTION.) (*KLYSTRONS; CAVITY RESONATORS; HARMONIC ANALYSIS; *RADIOFREQUENCY POWER; MEASUREMENTS.)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 805 62-2-6 DIV. 8

***LAMINAR BOUNDARY LAYER**

(LIQUIDS; *FILMS; CONDENSATION AND *HEAT TRANSFER IN METAL PLATES, SHEETS; MATHEMATICAL ANALYSIS BY *LAMINAR BOUNDARY LAYER; EQUATIONS OF STATE; FLUID MECHANICS; FLUID FLOW.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 592 62-2-6 DIV. 25

***LAMINATES**

(*HANDBOOKS; *LAMINATES; *PLASTICS; POLYMERS; ESTERS; REINFORCING MATERIALS; GLASS; *BONDING; ADHESIVES; RESIN ADHESIVES; *JOINTS; BOLTS; RIVETS; METAL SCREWS.) (LAMINATES; MECHANICAL PROPERTIES; TENSILE PROPERTIES; THICKNESS.) (*INSTRUCTION MANUALS; MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
AD-273 561 62-2-6 DIV. 14

(MATERIALS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; PHYSICAL PROPERTIES; TEST METHODS.) (*ADHESIVES; RESIN ADHESIVES; RUBBER ADHESIVES; *LAMINATES; RESINS; PLASTICS; GLASS TEXTILES; *SEALS; *SEALING COMPOUNDS.) (*ALLOYS; *STEEL (4130, 15-7PH, 4340, 300M); *STAINLESS STEEL (AM 350, A286, AM 355, 321, 422, PH 15-7 MO, 17-4 PH); *ALUMINUM ALLOYS (7075-T73, X2219-T81, VANADIUM ALLOYS.) (HONEYCOMB CORES; SANDWICH CONSTRUCTION; BRAZING; SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X, RENE' 41, H-252, INCONEL 718); CHROMIUM ALLOYS; COBALT ALLOYS; MOLYBDENUM ALLOYS; *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

(*AIRCRAFT CANOPIES; *TRANSPARENT PANELS; PLASTICS; *LAMINATES; MATERIALS; HEAT RESISTANT POLYMERS; EPOXY RESINS; GLASS; THERMAL INSULATION; CASTING; FEASIBILITY STUDIES; TESTS.) (SUPERSONIC PLANES; JET PLANES; JET FIGHTERS; AIRCRAFT CANOPIES; WINDSHIELDS; PRODUCTION; DESIGN; THERMAL STRESSES; SHOCK RESISTANCE.) TEST EQUIPMENT; TEST METHODS.
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 897 62-2-6 DIV. 1

***LANGUAGE**

(*ENGLISH LANGUAGE; *VOCABULARY; STATISTICAL ANALYSIS; DIGITAL COMPUTERS; PROGRAMMING.) MACHINE TRANSLATION.
INDIANA U., BLOOMINGTON.
AD-273 500 62-2-6 DIV. 32

(PROGRAMMING; *COMPUTER LOGIC; CODING; *LANGUAGE; MACHINES.) SWITCHING CIRCUITS.
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 759 62-2-6 DIV. 30

***LEARNING**

(*BIBLIOGRAPHY; *MEMORY.)
*LEARNING.
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 640 62-2-6 DIV. 28

***LEAST SQUARES METHOD**

(*LIGHT TRANSMISSION; *LIGHT) (*LEAST SQUARES METHOD; POLYNOMIALS; FOURIER ANALYSIS; FUNCTIONS.) SWEDEN.
UPPSALA U. (SWEDEN).
AD-273 588 62-2-6 DIV. 25

(*PLASMA PHYSICS; MEASUREMENT BY *MICROWAVE PROBES; THEORY.) (GAS DISCHARGES; ELECTRONS; IONS; TRANSPORT PROPERTIES.) (PHYSICAL PROPERTIES; DIFFUSION; EXCITATION; IONIZATION; TEMPERATURE; CONDUCTIVITY.) (LEAST SQUARES METHOD; PERTURBATION THEORY.)
ARMY ORDNANCE MISSILE COMMAND, REDSTONE ARSENAL, HUNTSVILLE, ALA.
AD-273 757 62-2-6 DIV. 25

***LENS ANTENNAS**

(*LENS ANTENNAS; ELECTROMAGNETIC LENSES; MICROWAVE EQUIPMENT; DESIGN FOR *RADAR ANTENNAS; RADAR SCANNING; THEORY; MATHEMATICAL ANALYSIS.) (PARABOLIC ANTENNAS; COUPLED ANTENNAS; TRANSMISSION LINES, COAXIAL CABLES; MICROWAVE FREQUENCY.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 611 62-2-6 DIV. 8

***LIGHT**

(DESIGN OF *EXPLOSIVES; *LIGHT SOURCES IN AN ARGON ATMOSPHERE FOR USE IN *SPARK SHADOWGRAPH PHOTOGRAPHY OF SUPERSONIC FLOW OF AIR THROUGH GLASS NOZZLES.) HIGH SPEED PHOTOGRAPHY.
NAVAL ORDNANCE TEST STATION; CHINA LAKE, CALIF.
AD-273 560 62-2-6 DIV. 22

(*LIGHT TRANSMISSION; *LIGHT) (*LEAST SQUARES METHOD; POLYNOMIALS; FOURIER ANALYSIS; FUNCTIONS.) SWEDEN.
UPPSALA U. (SWEDEN).
AD-273 588 62-2-6 DIV. 25

***LIGHT TRANSMISSION**

(*LIGHT TRANSMISSION; *LIGHT) (*LEAST SQUARES METHOD; POLYNOMIALS; FOURIER ANALYSIS; FUNCTIONS.) SWEDEN.
UPPSALA U. (SWEDEN).
AD-273 588 62-2-6 DIV. 25

***LINEAR SYSTEMS**

(COMMUNICATION SYSTEMS; DATA TRANSMISSION SYSTEMS; *DIGITAL SYSTEMS; *LINEAR SYSTEMS; *CODING; SEQUENCES; COMPUTER LOGIC; TEST METHODS; TESTS; OPERATION.) (DIGITAL COMPUTERS; ERRORS; CORRECTIONS.)
MONTANA STATE COLL., BOZEMAN.
AD-273 741 62-2-6 DIV. 30

(*ELECTRON BEAMS; *LINEAR SYSTEMS; *ELECTRON TUBES; MICROWAVE FREQUENCY THEORY.) (ELECTRONIC CIRCUITS; ELECTRON BEAMS; INTERACTION.) (ELECTRON BEAMS; VELOCITY MODULATION; DISTRIBUTION; MEASUREMENT; MATHEMATICAL ANALYSIS; CAVITY RESONATORS; ELECTRON GUNS.) (ELECTRON BEAMS; ELECTROMAGNETIC FIELDS; *SPACE CHARGES; *MICROWAVES; THEORY; MATHEMATICAL ANALYSIS; KLYSTRONS; NONLINEAR SYSTEMS; MICROWAVE AMPLIFIERS.)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 803 62-2-6 DIV. 8

(*ELECTRON BEAMS; *LINEAR SYSTEMS; ELECTRON TUBES; MICROWAVE FREQUENCY THEORY.) (ELECTRONIC CIRCUITS; ELECTRON BEAMS; ELECTRONS; INTERACTION.) (*KLYSTRONS; CAVITY RESONATORS; ELECTRON BEAMS; HARMONIC ANALYSIS; PLASMA PHYSICS; MAGNETIC FIELDS; MODULATION; PROPAGATION; SPACE CHARGES; MATHEMATICAL ANALYSIS.) MICROWAVE AMPLIFIERS; NONLINEAR SYSTEMS.)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 804 62-2-6 DIV. 8

(*ELECTRON BEAMS; *LINEAR SYSTEMS; *ELECTRON TUBES; MICROWAVE FREQUENCY THEORY.) (ELECTRON BEAMS; TEST EQUIPMENT.) *OXIDE CATHODES; *CATHODES (ELECTRON TUBES); *DIODES.
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 806 62-2-6 DIV. 8

***LIQUEFIED GASES**

(*LIQUEFIED GASES; *OXYGEN; CHEMICAL REACTIONS WITH *TITANIUM; *COMBUSTION; PRESSURE.) (OXIDATION INHIBITORS; HYDROGEN COMPOUNDS; FLUORIDES GAS OR ARGON AND COATINGS OF PHOSPHATES OR VAPOR PLATING, ALUMINUM.)
LIQUID ROCKET PROPELLANTS; METALS.
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
AD-273 489 62-2-6 DIV. 10

(PHYSICAL PROPERTIES OF *LIQUEFIED GASES DURING *WEIGHTLESSNESS; ATMOSPHERE ENTRY OF GUIDED MISSILE NOSES; RE-ENTRY VEHICLE.) (TEST EQUIPMENT; RECOVERY.)
SPACE TECHNOLOGY LABS., INC., REDONDO BEACH, CALIF.
AD-273 652 62-2-6 DIV. 25

***LIQUID ROCKET PROPELLANTS**

(*LIQUID ROCKET PROPELLANTS; *ROCKET OXIDIZERS; *ROCKET MOTORS; *SPECIFIC IMPULSE; MATHEMATICAL ANALYSIS.) (LIQUEFIED GASES; OXYGEN; NITROGEN COMPOUNDS; TETROXIDES; HYDRAZINES; METHYL HYDRAZINES; AMMONIA; CHLORIDES; PERCHLORYL RADICALS; FLUORINE; FLUORIDES; PENTABORANES; HYDROGEN; HYDROGEN COMPOUNDS; PERCXIDES; PERCHLORATES.) *HANDBOOKS; TABLES.
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 678 62-2-6 DIV. 10

(*LIQUID ROCKET PROPELLANTS; *ROCKET OXIDIZERS; ELECTROCHEMISTRY; SYNTHESIS.) (*NITROGEN COMPOUNDS; *OXYFLUORIDES FROM ELECTROLYSIS OF FLUORIDES, HYDROGEN COMPOUNDS, NITROGEN COMPOUNDS, TETROXIDES; NITRIC ACID.) (ELECTRODES, PLATINUM; NICKEL; ELECTROLYTIC CELLS; ELECTRIC POTENTIAL; ELECTRICAL CONDUCTANCE.)
ROCKETDYNE, CANOGA PARK, CALIF.
AD-273 844 62-2-6 DIV. 4

(*ROCKET MOTORS; PRESSURE; HEAT TRANSFER; COOLING; FUEL SYSTEMS; COMBUSTION CHAMBERS; DESIGN; THRUST; COMBUSTION; GAS FLOW; COMBUSTION CHAMBER GASES; THEORY; MATHEMATICAL ANALYSIS; RELIABILITY.) (ROCKET MOTOR NOZZLES; DESIGN.) (EXHAUST GASES; GAS FLOW.) (*LIQUID ROCKET PROPELLANTS; ROCKET FUELS; ROCKET OXIDIZERS; THERMODYNAMICS; PROPELLANT PROPERTIES.) (GAS TURBINES; GAS GENERATING SYSTEMS.) (FUEL INJECTORS; FUEL NOZZLES; FUEL SPRAYS.) INSTRUCTION MANUALS.
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 887 62-2-6 DIV. 27

***LIQUIDS**

(FEASIBILITY STUDIES OF *PHYSICAL PROPERTIES OF *DIPOLE ANTENNAS.) (MEASUREMENT OF ADMITTANCE; ELECTRICAL CONDUCTANCE; ELECTROSTATIC CAPACITANCE; ELECTRIC CURRENTS.) (STORAGE TANKS; *LIQUIDS; WATER.) (*EXPERIMENTAL DATA; TABLES.)
GORDON MCKAY LAB. OF APPLIED SCIENCE; HARVARD U., CAMBRIDGE, MASS.
AD-273 687 62-2-6 DIV. 8

***LITHIUM COMPOUNDS**

(*SINGLE CRYSTALS; CRYSTALS; *LITHIUM COMPOUNDS; *FLUORIDES; GROWTH; DETERIORATION; CORROSION; SOLUTIONS; CORROSIVE LIQUIDS; FATTY ACIDS; STEARIC ACIDS; CHEMICAL MILLING.)
RIAS, INC., BALTIMORE, MD.
AD-273 647 62-2-6 DIV. 25

(THERMODYNAMICS; *SOLID ROCKET PROPELLANTS; COMBUSTION; COMBUSTION CHAMBER GASES.) (VAPORIZATION; VAPOR PRESSURE OF *BORON COMPOUNDS; OXIDES; *LITHIUM COMPOUNDS;

OXIDES, LITHIUM COMPOUNDS, BORATES, *BERYLLIUM COMPOUNDS, FLUORIDES.) (SPECIFIC HEAT, MEASUREMENT, TEST METHODS, TANTALUM, TESTS.) (MASS SPECTROSCOPY OF BORON COMPOUNDS, OXIDES, MAGNESIUM COMPOUNDS, FLUORIDES, IONIZATION.) (DATA, TABLES.)
AERONUTRONIC, NEWPORT BEACH, CALIF.
AD-273 792 62-2-6 DIV. 10

*LOW TEMPERATURE RESEARCH

(*TESTS AND DESIGN OF *MASERS BY *TUNED AMPLIFIERS.) (ANALYSIS BY *LOW TEMPERATURE RESEARCH, MATERIALS OF CRYSTALS, *OXIDES, *TITANIUM COMPOUNDS WITH CHROMIUM, THIN FILMS.) (WAVEGUIDES, FERRITES, DIELECTRICS, FERROMAGNETIC MATERIALS.)
AIRBORNE INSTRUMENTS LAB., INC., MINEOLA, N. Y.
AD-273 866 62-2-6 DIV. 25

(*LOW TEMPERATURE RESEARCH ON *PLASMA JETS.) (RESEARCH PROGRAM ADMINISTRATION, *ABSTRACTING OF SCIENTIFIC RESEARCH RELATED TO EXPERIMENTAL DATA AND THEORY OF ENERGY, *TRANSPORT PROPERTIES AND IONIZATION OF *GAS FLOW.) BIBLIOGRAPHY.
AERCHEM RESEARCH LABS., INC., PRINCETON, N. J.
AD-273 889 62-2-6 DIV. 25

*LUNAR PROBES

(*LUNAR PROBES, MOBILE, *POWER SUPPLIES, *AUXILIARY POWER PLANTS.) (SOLAR CELLS OF SILICON, THERMOELECTRICITY, NUCLEAR POWER PLANTS, ELECTRIC POWER PRODUCTION, STORAGE BATTERIES, PRIMARY BATTERIES, ELECTROCHEMISTRY, THERMIONIC EMISSION.) (MOON, SURFACE PROPERTIES, SPACE ENVIRONMENTAL CONDITIONS, EXPLORATION.)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 811 62-2-6 DIV. 12

(*LUNAR PROBES, MOBILE, COMMUNICATION EQUIPMENT.) (*RADIO COMMUNICATION SYSTEMS, *TELEVISION COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PULSE MODULATION, CODING, MATHEMATICAL ANALYSIS.) (RADIOFREQUENCY POWER OF *RADIO TRANSMITTERS, ANTENNAS FOR RADIO RECEIVERS.) (*MOON TO EARTH, COMMUNICATION SYSTEMS.)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 812 62-2-6 DIV. 12

***MAGNETIC CORES**

(DATA PROCESSING SYSTEMS, DATA STORAGE SYSTEMS, COMPUTER LOGIC, *DIGITAL COMPUTERS, *MEMORY DEVICES, *MAGNETIC CORES, *MAGNETIC TAPE, FERROMAGNETIC MATERIALS,) (*MANUFACTURING METHODS, PROCESSING, MAGNETIC TAPES, ELECTRODEPOSITION, METALLIC SMOKE DEPOSITS, *THIN FILMS, GLASS, METALS,)
REMINGTON RAND UNIVAC DIV., SPERRY RAND CORP., ST. PAUL, MINN.
AD-273 749 62-2-6 DIV. 30

***MAGNETIC DETECTORS**

(*OPTICAL FILTERS FOR IMPROVING RESOLUTION OF LIGHT PULSES FROM *MINE DETECTORS, *MAGNETIC DETECTORS,) (MINES, DETECTION,) CORRELATION TECHNIQUES, MATHEMATICAL ANALYSIS, TRANSFORMATIONS (MATHEMATICS), SAMPLING,
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 549 62-2-6 DIV. 6

***MAGNETIC FIELDS**

(*MICROWAVES, *ELECTRIC FIELDS, *MAGNETIC FIELDS, MEASUREMENT, SCATTERING, WIRE, RESONANCE, MATHEMATICAL ANALYSIS, THEORY,) *DIPOLE ANTENNAS,
SYRACUSE U. RESEARCH INST., N. Y.
AD-273 847 62-2-6 DIV. 8

***MAGNETIC RECORDING SYSTEMS**

(*MAGNETIC RECORDING SYSTEMS, *MAGNETIC TAPE, RECORDING DEVICES, MINIATURE ELECTRONIC EQUIPMENT, TRANSISTORS, DESIGN, TESTS, TEST METHODS,) *DATA STORAGE SYSTEMS,
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 764 62-2-6 DIV. 9

***MAGNETIC TAPE**

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, DESIGN, FILMS,) (*MEMORY DEVICES, *MAGNETIC TAPE, COMPUTER LOGIC,) (THIN FILMS, FERROMAGNETIC MATERIALS, DESIGN,) (ELECTRONIC CIRCUITS, AMPLIFIERS, TRANSISTORS,)
REMINGTON RAND UNIVAC DIV., SPERRY CORP., ST. PAUL, MINN.
AD-273 748 62-2-6 DIV. 30

(DATA PROCESSING SYSTEMS, DATA STORAGE SYSTEMS, COMPUTER LOGIC, *DIGITAL COMPUTERS, *MEMORY DEVICES, *MAGNETIC CORES, *MAGNETIC TAPE, FERROMAGNETIC MATERIALS,) (MANUFACTURING METHODS, PROCESSING, MAGNETIC TAPES, ELECTRODEPOSITION, METALLIC SMOKE DEPOSITS, *THIN FILMS, GLASS, METALS,)
REMINGTON RAND UNIVAC DIV., SPERRY RAND CORP., ST. PAUL, MINN.
AD-273 749 62-2-6 DIV. 30

(*MAGNETIC RECORDING SYSTEMS, *MAGNETIC TAPE, RECORDING DEVICES, MINIATURE ELECTRONIC EQUIPMENT, TRANSISTORS, DESIGN, TESTS, TEST METHODS,) *DATA STORAGE SYSTEMS,
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 764 62-2-6 DIV. 9

***MAGNETOHYDRODYNAMICS**

(*MAGNETOHYDRODYNAMICS, *EXTREMELY LOW FREQUENCY, *ELECTROMAGNETIC WAVES, MAGNETIC FIELDS, OSCILLATIONS, CONDUCTIVITY, WAVES,) (*TERRESTRIAL MAGNETISM, *SOLAR DISTURBANCES, *FLUID FLOW,) (TRANSFORMATIONS (MATHEMATICS), PARTIAL DIFFERENTIAL EQUATIONS, PERTURBATION THEORY,)
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 692 62-2-6 DIV. 25

(*MAGNETOHYDRODYNAMICS, *GENERATORS, ELECTROMAGNETIC FIELDS IN ROTATION,) (*ELECTRICAL EQUIPMENT, ELECTRIC MOTORS, TURBINES, *GAS TURBINE ROTORS,) (HYDRODYNAMICS OF EQUATIONS, MOTION, PARTIAL DIFFERENTIAL EQUATIONS,) USSR.
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 885 62-2-6 DIV. 25

***MANUFACTURING METHODS**

(*MANUFACTURING METHODS, PROCESSING, *FILAMENT WOUND CONSTRUCTION, MATERIALS, DESIGN, CASTING, TEST METHODS, *FIBRE BINDING MACHINES,) (WATER, SOLUBILITY, SAND, SILICON COMPOUNDS, CALCIUM COMPOUNDS, OXIDES, INORGANIC SUBSTANCES, CARBOHYDRATES,) (METALS, ALUMINUM, STRUCTURES,) (HEAT TREATMENT, DEFORMATION, STRESSES, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES,) PRESSURE VESSELS, ROCKET CASES,
ROCKETDYNE, CANOGA PARK, CALIF.
AD-273 917 62-2-6 DIV. 26

(HIGH TEMPERATURE RESEARCH, SILICON COMPOUNDS, CARBIDES, *CRYSTAL RECTIFIERS, ELECTRONIC EQUIPMENT, GUIDED MISSILES, SATELLITE VEHICLES, SUPERSONIC PLANES,) (RECTIFIERS, *CRYSTALS, *PRODUCTION, *MANUFACTURING METHODS, ENCAPSULATION, SUBLIMATION, PYROLYSIS,)
WESTINGHOUSE ELECTRIC CORP., DAYTON, OHIO.
AD-273 989 62-2-6 DIV. 8

(*PHOTOENGRAVING, PROCESSING, PRODUCTION, *MANUFACTURING METHODS, SOLID STATE PHYSICS, ELECTRONIC EQUIPMENT, TRANSISTORS, SILICON,) SEMICONDUCTORS, MATERIALS, RESISTANCE, TEST METHODS, TESTS,
DIAMOND ORDNANCE FUZE LABS., WASHINGTON, D. C.
AD-273 618 62-2-6 DIV. 26

(*RADIOFREQUENCY COILS, *MINIATURE ELECTRONIC EQUIPMENT, FERROMAGNETIC MATERIALS, FERRITES, THIN FILMS, METAL FILMS, NICKEL ALLOYS, IRON ALLOYS, CHLORIDES, OXIDES, ZINC ALLOYS, COBALT ALLOYS, ELECTROPLATING, PROCESSING, *MANUFACTURING METHODS, PRODUCTION, DESIGN,) (COILS, INDUCTANCE, MEASUREMENT,)
MOTOROLA, INC., PHOENIX, ARIZ.
AD-273 835 62-2-6 DIV. 8

(*TRANSISTORS, GERMANIUM, SILICON, SEMICONDUCTORS, *PACKAGING, *SUBMINIATURE ELECTRONIC EQUIPMENT, PRODUCTION, *MANUFACTURING METHODS, DESIGN, TESTS,)
SYLVANIA ELECTRIC PRODUCTS, INC., WOBURN, MASS.
AD-273 848 62-2-6 DIV. 8

***MARINE PROPELLERS**

(*MARINE PROPELLERS, PROPELLER BLADES, SHEETS, SHIP HULLS, INTERFERENCE, HYDRODYNAMICS, VORTICES, WAKE, THRUST, DRAG, LIFT, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS,) THEORY,
TECHNICAL RESEARCH GROUP, SYOSSET, N. Y.
AD-273 852 62-2-6 DIV. 9

***MASERS**

(*BIBLIOGRAPHY OF *SCIENTIFIC PERSONNEL ACTIVE IN USSR, MASER, *SCIENTIFIC RESEARCH,) QUANTUM MECHANICS, RADIO WAVES, PHYSICS,) SEMICONDUCTORS, ORGANIC MATERIALS,
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 854 62-2-6 DIV. 25

(*TESTS AND DESIGN OF *MASERS BY *TUNED AMPLIFIERS,) (ANALYSIS BY *LOW TEMPERATURE RESEARCH, MATERIALS OF CRYSTALS, *OXIDES, *TITANIUM COMPOUNDS WITH CHROMIUM, THIN FILMS,) (WAVEGUIDES, FERRITES, DIELECTRICS, FERROMAGNETIC MATERIALS,)
AIRBORNE INSTRUMENTS LAB., INC., MINEOLA, N. Y.
AD-273 866 62-2-6 DIV. 25

***MATERIALS**

(*MATERIALS FOR SPACESHIPS AND SATELLITE VEHICLES, *REFRACTORY MATERIALS, *ALLOYS, *COATINGS, METALLIC TEXTILES, SOLID ROCKET PROPELLANTS, *METALS, FOAMS, BERYLLIUM COMPOUNDS, OXIDES, OPTICS, ABLATION, *PLASTICS, *ELASTOMERS, ADHESIVES, FILAMENT WOUND CONSTRUCTION, CRYOGENICS, SHIELDING,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 476 62-2-6 DIV. 14

(MEASUREMENT OF GAS FLOW BY SENSITIVITY OF *ELECTRICAL CONDUCTANCE, *INSTRUMENTATION, CALIBRATION,) (TRANSDUCERS, TESTS, STANDARDS OF *ABLATION, *MATERIALS, *ELECTRICAL PROPERTIES,) (*PLASMA JETS, GAS IONIZATION IN RE-ENTRY AERODYNAMICS,)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 501 62-2-6 DIV. 25

***MATHEMATICAL LOGIC**

(*VIDEO NETWORKS, DESIGN OF *OPTICAL EQUIPMENT, PHOTOELECTRIC CELLS, PHOTOGRAPHIC FILM, OPTICAL FILTERS, FLASH LAMPS,) (*MATHEMATICAL LOGIC, SEQUENCES, ERRORS, ANALYSIS,)
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
AD-273 536 62-2-6 DIV. 25

(PROBABILITY, MEASUREMENT, SAMPLING,) (MATHEMATICAL ANALYSIS, *PATHEMATICAL LOGIC, EQUATIONS,) (*MEASURE THEORY, TABLES,) (DIGITAL COMPUTERS, CODING, STATISTICAL DISTRIBUTIONS, STATISTICAL PROCESSES,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 571 62-2-6 DIV. 15

***MEASURE THEORY**

(PROBABILITY, MEASUREMENT, SAMPLING,) (MATHEMATICAL ANALYSIS, *PATHEMATICAL LOGIC, EQUATIONS,) (*MEASURE THEORY, TABLES,) (DIGITAL COMPUTERS, CODING, STATISTICAL DISTRIBUTIONS, STATISTICAL PROCESSES,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 571 62-2-6 DIV. 15

***MECHANICAL PROPERTIES**

(METALS, *SHEETS, *BERYLLIUM, MANUFACTURING METHODS, PROCESSING,) (TESTS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, ELASTICITY, DEFORMATION, STRESSES,) (ALLOYS, STAINLESS STEEL (PH15-7MO,RH950), TITANIUM ALLOYS (TI6AL-4V),)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 707 62-2-6 DIV. 17

(MATERIALS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, PHYSICAL PROPERTIES, TEST METHODS,) (*ADHESIVES, RESIN ADHESIVES, RUBBER ADHESIVES, *LAMINATES, RESINS, PLASTICS, GLASS TEXTILES, *SEALS, *SEALING COMPOUNDS,) (*ALLOYS, *STEEL (AISI 1330, 19-7PH, 4340, 300F), *STAINLESS STEEL (AM 350, A286, AM 355, 321, 422, PH 15-7 MO, 17-4 PH), *ALUMINUM ALLOYS (7075-T73, X2219-T81, VANADIUM ALLOYS,) (HONEYCOMB CORES, SANDWICH CONSTRUCTION, BRAZING, SILVER SOLDERS (AMS 4770),) (*NICKEL ALLOYS (INCONEL-X, RENE' 41, A-252, INCONEL 718), CHROMIUM ALLOYS, COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS,)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***MEDICAL RESEARCH**

(*MEDICAL RESEARCH, *OXYGEN CONSUMPTION, *AVIATION PERSONNEL,) (ALTITUDE CHAMBERS, LOW PRESSURE RESEARCH, NAVAL PERSONNEL, DIET, METABOLISM, SLEEP, BLOOD, METABOLIC PRODUCTS, SIMULATION,)
NAVAL MISSILE AND ASTRONAUTICS CENTER, POINT MUGU, CALIF.
AD-273 863 62-2-6 DIV. 16

***MEMORY**

(*BIBLIOGRAPHY, *MEMORY,) *LEARNING,
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 640 62-2-6 DIV. 28

***MEMORY DEVICES**

(*CRYOGENICS, MATHEMATICAL LOGIC, COMPUTERS, *DATA PROCESSING SYSTEMS, THIN FILMS,) (*SWITCHING CIRCUITS, ELECTRONIC CIRCUITS, SUPERCONDUCTORS, TRIGGER CIRCUITS,) (THERMAL CONDUCTIVITY, MEASUREMENT, MATERIALS,) (*MEMORY DEVICES, DESIGN,)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 738 2-2-6 DIV. 30

(*CRYOGENICS, *DATA PROCESSING SYSTEMS, THIN FILMS OF TIN AND INDIUM, CIRCUITS, SUPERCONDUCTORS,) (*SWITCHING CIRCUITS, *MEMORY DEVICES, MATERIALS, DESIGN, MATHEMATICAL LOGIC,)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 736 2-2-6 DIV. 30

(*DATA PROCESSING SYSTEMS, *DIGITAL COMPUTERS, DESIGN, FILMS,) (*MEMORY DEVICES, *MAGNETIC TAPE, COMPUTER LOGIC,) (THIN FILMS, FERROMAGNETIC MATERIALS, DESIGN,) (ELECTRONIC CIRCUITS, AMPLIFIERS, TRANSISTORS,)
REMINGTON RAND UNIVAC DIV., SPERRY CORP., ST. PAUL, MINN.
AD-273 748 62-2-6 DIV. 30

(DATA PROCESSING SYSTEMS, DATA STORAGE SYSTEMS, COMPUTER LOGIC, *DIGITAL COMPUTERS, *MEMORY DEVICES, *MAGNETIC CORES, *MAGNETIC TAPE, FERROMAGNETIC MATERIALS,) (MANUFACTURING METHODS, PROCESSING, MAGNETIC TAPES, ELECTRODEPOSITION, METALLIC SMOKE DEPOSITS, *THIN FILMS, GLASS, METALS,)
REMINGTON RAND UNIVAC DIV., SPERRY RAND CORP., ST. PAUL, MINN.
AD-273 749 62-2-6 DIV. 30

(*INFORMATION THEORY, *MEMORY DEVICES, DATA STORAGE SYSTEMS, DATA TRANSMISSION SYSTEMS,) (MAGNETIC TAPE, COMPUTERS, *DATA PROCESSING SYSTEMS, SWITCHING CIRCUITS, *COMPUTER LOGIC, SEQUENCES, CODING, PROBABILITY,) (TIME INTERVAL COUNTERS, ERRORS, ANALYSIS,) THESES,
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON,
AD-273 785 62-2-6 DIV. 30

***METAL COATINGS**

(*PLATING, *CHROMIUM PLATING, *NICKEL PLATING WITHOUT ELECTRODES, *METAL COATINGS, DEPOSITS OF NICKEL ALLOYS, COBALT ALLOYS, CHROMIUM ALLOYS, IRON ALLOYS ON STEEL, MAGNESIUM, ALUMINUM BY CHEMICAL REACTIONS, REDUCTION,) (STANNATES, COATINGS ON MAGNESIUM,) ALLOYS, METALS,
ROCK ISLAND ARSENAL LAB., ILL.
AD-273 648 62-2-6 DIV. 26

***METAL PLATES**

(*STEEL, *SHIP PLATES, *METAL PLATES, SHEETS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, MANUFACTURING METHODS, ROLLING MILLS, HEAT TREATMENT, FAILURE (MECHANICS), FRACTURE (MECHANICS), TEST METHODS, IMPACT SHOCK, MICROSTRUCTURE,)
NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
AD-273 767 62-2-6 DIV. 17

***METALLIC COMPOUNDS**

(*SILICON COMPOUNDS, *METALLIC COMPOUNDS, *BORIDES, CARBIDES, NITRIDES, POWDER METALS, CRYSTAL STRUCTURE, PHYSICAL PROPERTIES, DENSITY, CHEMICAL PROPERTIES, HEAT OF FORMATION, SINTERING, HYDRAULIC PRESSES,) (SILICON COMPOUNDS, TITANIUM COMPOUNDS, CHROMIUM COMPOUNDS, BORIDES,) REFRACTORY MATERIALS, USSR, METALS AND CERAMICS LAB., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 601 62-2-6 DIV. 4

***METALLURGICAL ANALYSIS**

(ALLOYS, SHEETS, *NICKEL ALLOYS (AISI 9340), CHROMIUM ALLOYS, MANGANESE ALLOYS, COBALT ALLOYS, MANUFACTURING METHODS, PROCESSING, HEAT TREATMENT, AUSTENITE,) (TESTS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, HARDNESS, IMPACT SHOCK, *FRACTURE (MECHANICS), DEFORMATION, GRAINS (METALLURGY), MICROSTRUCTURE, *METALLURGICAL ANALYSIS,)
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 705 2-2-6 DIV. 17

***METALS**

(*MATERIALS FOR SPACESHIPS AND SATELLITE VEHICLES, *REFRACTORY MATERIALS, *ALLOYS, *COATINGS, *METALLIC TEXTILES, SOLID ROCKET PROPELLANTS, *METALS, FOAMS, BERYLLIUM COMPOUNDS, CHILES, OPTICS, ABLATION, *PLASTICS, *ELASTOMERS, ADHESIVES, FILAMENT WOUND CONSTRUCTION, CRYOGENICS, SHIELDING,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 478 62-2-6 DIV. 14

(*ALLOYS, *METALS, PHASE STUDIES, LIQUIDS, *VISCOSITY, MEASUREMENT, THEORY, CRYSTALLIZATION, IMPURITIES,) (DATA, STEEL, CAST IRON, IRON ALLOYS, CHROMIUM ALLOYS, CARBON ALLOYS, LEAD, TIN, BISMUTH, ALUMINUM, TIN ALLOYS, LEAD ALLOYS, BISMUTH ALLOYS, ZINC, CADMIUM,)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 563 62-2-6 DIV. 17

(*HEAT RESISTANT PAINTS, PREPARATION FROM METALLIC COMPOUNDS, ZINC COMPOUNDS, OXIDES, METHYL RADICALS, HYDROGEN COMPOUNDS, PHOSPHITES, ETHYL RADICALS, PHOSPHATES, PROCESSING, AGING,) (*COATINGS FOR *METALS, ORGANIC COATINGS, CERAMIC COATINGS, PHOSPHATE COATINGS, ZIRCONATES, TITANATES, STANNATES,) (TESTS, RESISTANCE, TEMPERATURE, WATER, WEATHERPROOFING, HARDNESS, BONDING, SURFACE PROPERTIES,)
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
AD-273 582 62-2-6 DIV. 14

(*HEAT RESISTANT PAINTS, PREPARATION FROM METALLIC COMPOUNDS, ZINC COMPOUNDS, OXIDES, METHYL RADICALS, HYDROGEN COMPOUNDS, PHOSPHITES, ETHYL RADICALS, PHOSPHATES,) (*COATINGS FOR *METALS, ORGANIC COATINGS, CERAMIC COATINGS, PHOSPHATE COATINGS, ZIRCONATES, TITANATES, STANNATES, TESTS, THICKNESS, HARDNESS, SURFACE PROPERTIES, BONDING, RESISTANCE, TEMPERATURE, WATER, WEATHERPROOFING,)
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
AD-273 583 62-2-6 DIV. 14

(*BIBLIOGRAPHY, *MINERALS, *METALS,) (COBALT, COPPER, LEAD, IRON, MANGANESE, MERCURY, NICKEL, SILVER, ZINC, ANTIMONY, ARSENIC, BISMUTH, SELENIUM, SULFUR, TELLURIUM,)
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
AD-273 703 2-2-6 DIV. 17

(*ELECTRONS, DENSITY IN *METALS AND *GASES,) (WAVE ANALYSIS, *QUANTUM MECHANICS, NUCLEAR SPINS, ATOMIC ORBITALS, LATTICES, THEORY,)
SHEFFIELD U. (GT. BRIT.),
AD-273 793 62-2-6 DIV. 25

***METEORS**

(*METEORS, IONIZATION, IONOSPHERE, DETECTION, *RADAR, STATISTICAL ANALYSIS,) (RADIO ASTRONOMY, RADAR,)
GEORGIA INST. OF TECH., ENGINEERING EXPERIMENT STATION, ATLANTA,
AD-273 769 62-2-6 DIV. 2

***METERS**

(MEASUREMENT, *ELECTRICAL CONDUCTANCE OF AIR, IONIZATION DURING *RE-ENTRY AERODYNAMICS,) (*INSTRUMENTATION, DESIGN OF SHOCK WAVES, *CONDUCTIVITY, *METERS FOR SATELLITE VEHICLES,) (CALIBRATION AND FLIGHT TESTING UNDER *SPACE ENVIRONMENTAL CONDITIONS,) (MAGNETOHYDRODYNAMICS, EXPERIMENTAL DATA, RELIABILITY,)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 478 62-2-6 DIV. 9

***METHYL HYDRAZINES**

(*METHYL HYDRAZINES, RESPIRATION, DOSAGE, LABORATORY ANIMALS, SURVIVAL,) (*TOXICITY, STRESS (PHYSIOLOGY), PATHOLOGY, NERVOUS SYSTEM,)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS., ARMY CHEMICAL CENTER, MD.
AD-273 490 62-2-6 DIV. 10

***MICROWAVE EQUIPMENT**

(*MICROWAVE EQUIPMENT, *TRANSMISSION LINES, WAVEGUIDES, WAVE TRANSMISSION, ELECTRIC FIELDS, MAGNETIC FIELDS, BESSEL FUNCTIONS, MATHEMATICAL ANALYSIS, DESIGN,)
BOEING CO., RENTON, WASH.
AD-273 615 62-2-6 DIV. 8

***MICROWAVE OSCILLATORS**

(FREQUENCY, CONTROL OF AN EXTREMELY HIGH FREQUENCY, *KLYSTRONS, *MICROWAVE OSCILLATORS,) (*RADAR TRANSMITTERS, MICROWAVE FREQUENCY, DESIGN, STABILIZATION SYSTEMS, PHASE STUDIES, STABILIZATION,)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON,
AD-273 509 62-2-6 DIV. 8

***MICROWAVE PROBES**

(*MICROWAVE PROBES, *PLASMA PHYSICS, *ANTENNAS, *WAVEGUIDE WINDOWS,) (*REFLECTOMETERS, OSCILLOGRAMS, *WAVEGUIDES, ATTENUATION,) (INSTRUMENTATION, DESIGN UNDER FLIGHT TESTING,) (BOUNDARY LAYER, SHOCK WAVES, PROPAGATION, WAVE TRANSMISSION,)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 740 62-2-6 DIV. 25

(*PLASMA PHYSICS, MEASUREMENT BY *MICROWAVE PROBES, THEORY,) (GAS DISCHARGES, ELECTRONS, IONS, TRANSPORT PROPERTIES,) (PHYSICAL PROPERTIES, DIFFUSION, EXCITATION, IONIZATION, TEMPERATURE, CONDUCTIVITY,) (LEAST SQUARES METHOD, PERTURBATION THEORY,)
ARMY ORDNANCE MISSILE COMMAND, REDSTONE ARSENAL, HUNTSVILLE, ALA.
AD-273 757 62-2-6 DIV. 25

(*PLASMA PHYSICS, MEASUREMENT BY *CAVITY RESONATORS, MICROWAVE EQUIPMENT, *RADIOFREQUENCY POWER, *MICROWAVE PROBES,) (FERRITES, MAGNETRONS, KLYSTRONS, OSCILLOGRAMS, FREQUENCY MODULATION, QUARTZ RESONATORS, WAVEGUIDES,) (ANALYSIS, PERTURBATION THEORY, ELECTRONS, DENSITY,)
RESEARCH LAB. OF ELECTRONICS, MASS. INST. OF TECH., CAMBRIDGE,
AD-273 830 62-2-6 DIV. 25

***MICROWAVE SPECTROSCOPY**

(*MICROWAVE SPECTROSCOPY, MINIATURE ELECTRONIC EQUIPMENT, FREQUENCY MULTIPLIERS, RADIOFREQUENCY SPECTRUM ANALYZERS, EXTREMELY HIGH FREQUENCY, DIODES, SEMICONDUCTORS,) (*MOLECULAR SPECTROSCOPY, HYPERFINE STRUCTURE,) (FLUORIDES, CHLORIDES, IODIDES, CYANIDES, ACETYLENES, CYANAMIDES, AZO RADICALS, METHANES, NITRAMIDES, THIOLS,) SPECTROMETERS, GREAT BRITAIN,
BIRMINGHAM U. (GT. BRIT.),
AD-273 614 62-2-6 DIV. 8

***MICROWAVES**

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY,) (ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (ELECTRON BEAMS, VELOCITY, MODULATION, DISTRIBUTION, MEASUREMENT, MATHEMATICAL ANALYSIS, CAVITY RESONATORS, ELECTRON GUNS,) (ELECTRON BEAMS, ELECTROMAGNETIC FIELDS, *SPACE CHARGES, *MICROWAVES, THEORY, MATHEMATICAL ANALYSIS, KLYSTRONS, NONLINEAR SYSTEMS, MICROWAVE AMPLIFIERS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 803 62-2-6 DIV. 8

(*MICROWAVES, *ELECTRIC FIELDS, *MAGNETIC FIELDS, MEASUREMENT, SCATTERING, LINE, RESONANCE, MATHEMATICAL ANALYSIS, THEORY,) *DIPOLE ANTENNAS,
SYRACUSE U. RESEARCH INST., N. Y.
AD-273 847 62-2-6 DIV. 8

***MILITARY COMMUNICATIONS**

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, DATA TRANSMISSION SYSTEMS, VOICE COMMUNICATION SYSTEMS, SECRET COMMUNICATION SYSTEMS, TELETYPE SYSTEMS, RADIO COMMUNICATION SYSTEMS, TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS,) (*COMMUNICATION EQUIPMENT, ELECTRONIC SWITCHES, *SWITCHING CIRCUITS, ANALOG SYSTEMS, DIGITAL SYSTEMS, TRANSMISSION,)
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 682 62-2-6 DIV. 5

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, *VOICE COMMUNICATION SYSTEMS, *TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE TRANSMISSION,) (CODING, PULSE MODULATION, AUDITORY SIGNALS,) *PANEL BOARDS (ELECTRICITY),
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 683 62-2-6 DIV. 5

***MILITARY EQUIPMENT**

(*DATA, *STANDARDS, SPECIFICATIONS, HANDBOOKS,) (*MILITARY EQUIPMENT, *AIR FORCE EQUIPMENT, *AIR FORCE SUPPLIES, STANDARDIZATION, MILITARY REQUIREMENTS, PRODUCTION, CONTROL, MANAGEMENT ENGINEERING,) BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO,
AD-273 890 62-2-6 DIV. 29

***MILITARY TRANSPORTATION**

(*SYMPOSIA, *SHOCK, *VIBRATION, *PACKAGING, *TRANSPORTATION, MEASUREMENT, SIMULATION, DESIGN,) (RAILROADS, RAILROAD TRACKS, RAILROAD CARS, CARGO, SHIPPING,) (*MILITARY TRANSPORTATION, CARGO VEHICLES, TERRAIN, ROADS, RAILS,) (PACKAGING, CONTAINERS, STORAGE, MATERIALS, FOAM RUBBER, FOAMS, CELLULOSE, HANDLING, GUIDED MISSILES, NUCLEAR POWER PLANTS, DESIGN, TRAILERS, ELECTRONIC EQUIPMENT,) (AIR TRANSPORTATION, AIR DROP OPERATIONS, AIRBORNE, CONTAINERS,)
ASSISTANT SECRETARYY OF DEFENSE, RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 913 62-2-6 DIV. 11

***MINE DETECTORS**

(*OPTICAL FILTERS FOR IMPROVING RESOLUTION OF LIGHT PULSES FROM *MINE DETECTORS, *MAGNETIC DETECTORS,) (MINES, DETECTION,) CORRELATION TECHNIQUES, MATHEMATICAL ANALYSIS, TRANSFORMATIONS (MATHEMATICS), SAMPLING,
GOODYEAR AIRCRAFT CORP., AKRON, OHIO,
AD-273 949 62-2-6 DIV. 6

***MINERALS**

(*BIBLIOGRAPHY, *MINERALS, *METALS,) (COBALT, COPPER, LEAD, IRON, MANGANESE, MERCURY, NICKEL, SILVER, ZINC, ANTIMONY, ARSENIC, BISMUTH, SELENIUM, SULFUR, TELLURIUM,)
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
AD-273 703 2-2-6 DIV. 17

***MINIATURE ELECTRONIC EQUIPMENT**

(*RADIOFREQUENCY COILS, *MINIATURE ELECTRONIC EQUIPMENT, FERROMAGNETIC MATERIALS, FERRITES, THIN FILMS, METAL FILMS, NICKEL ALLOYS, IRON ALLOYS, CHLORIDES, OXIDES, ZINC ALLOYS, COBALT ALLOYS, ELECTROPLATING, PROCESSING, *MANUFACTURING METHODS, PRODUCTION DESIGN,) (COILS, INDUCTANCE, MEASUREMENT,)
MOTOROLA, INC., PHOENIX, ARIZ.
AD-273 835 62-2-6 DIV. 8

(*SEMICONDUCTORS, SILICON ALLOYS, ELECTRONIC CIRCUITS, MATERIALS, PROCESSING, MANUFACTURING METHODS, CHEMICAL MILLING, DIFFUSION, PACKAGING,) (*DIGITAL COMPUTERS, *SUBMINIATURE ELECTRONIC EQUIPMENT, *MINIATURE ELECTRONIC EQUIPMENT, ELECTRONIC CIRCUITS, SWITCHING CIRCUITS, TRANSISTORS, DIODES, RESISTORS, CAPACITORS, DESIGN, TESTING,)
TEXAS INSTRUMENTS INC., DALLAS, TEX.
AD-273 850 62-2-6 DIV. 8

***MIRRORS**

(OPTICS, *MIRRORS, *REFLECTORS, MANUFACTURING METHODS, ELECTROFORMING, SURFACES, COATINGS, METAL COATINGS, RHODIUM, THIN FILMS, FILMS, FEASIBILITY STUDIES,) (ELECTROPLATING, PLATING, NICKEL PLATING,)
OPTICAL MATERIALS,
ELECTRO-OPTICAL SYSTEMS, INC., PASADENA, CALIF.
AD-273 690 62-2-6 DIV. 30

***MIXTURES**

(*INTERFEROMETERS, *PHOTOGRAPHIC ANALYSIS OF IGNITION AND DETONATION OF GASES,) (*MIXTURES OF HYDROGEN AND OXYGEN,) (ACCELERATION OF *FLAMES IN EXPLOSIVE GASES,)
CALIFORNIA U., BERKELEY,
AD-273 684 62-2-6 DIV. 10

***MODEL TESTS**

(DESIGN OF *JETTISONABLE COCKPITS, EJECTION SEATS FOR SUPERSONIC PLANES,) (*MODEL TESTS ON TRACKS (AERODYNAMICS), *WIND TUNNEL MODELS,) (AERODYNAMIC CONFIGURATIONS, PRESSURE CAPSULES, HUMAN ENGINEERING, PARACHUTE DESCENTS, STABILIZATION SYSTEMS, RECOVERY, SEA RESCUES, *AVIATION SAFETY,) (TESTS, LIFT, DRAG, PITCH, MOMENTS, YAW, STABILITY, DATA, TABLES,) (EFFECTIVENESS OF TOWED BODIES WITH PNEUMATIC DEVICES FOR STABILIZATION,)
GOODYEAR AIRCRAFT CORP., AKRON, OHIO,
AD-273 626 62-2-6 DIV. 1

***MODULATORS**

(*SEMICONDUCTORS, *DIODES, *MODULATORS, DETECTORS, CIRCUITS, DESIGN, TRANSISTORS, *ELECTRONIC CIRCUITS, HIGH FREQUENCY, VERY HIGH FREQUENCY, THEORY, OPERATION, MEASUREMENT, MATHEMATICAL ANALYSIS, *BIBLIOGRAPHY,)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON,
AD-273 910 62-2-6 DIV. 8

***MOLECULAR SPECTROSCOPY**

(*MICROWAVE SPECTROSCOPY, MINIATURE ELECTRONIC EQUIPMENT, FREQUENCY MULTIPLIERS, RADIOFREQUENCY SPECTRUM ANALYZERS, EXTREMELY HIGH FREQUENCY, DIODES, SEMICONDUCTORS.) (*MOLECULAR SPECTROSCOPY, HYPERFINE STRUCTURE.) (FLUORIDES, CHLORIDES, IODIDES, CYANIDES, ACETYLENES, CYANAMIDES, AZO RADICALS, METHANES, NITRAMIDES, THIOLS.) SPECTROPHOTOMETERS, GREAT BRITAIN, BIRMINGHAM U. (GT. BRIT.).
AD-273 614 62-2-6 DIV. 8

***MOLYBDENUM ALLOYS**

(*SANDWICH PANELS, MANUFACTURING METHODS, DESIGN, *BRAZING, HONEYCOMB CORES, REFRACTORY MATERIALS, METALS, *MOLYBDENUM ALLOYS, *NIOBIUM ALLOYS, TITANIUM ALLOYS, ZIRCONIUM ALLOYS.) (REFRACTORY COATINGS, SANDWICH CONSTRUCTION, OXIDATION INHIBITORS, HEAT SHIELDING, SPACESHIPS, SATELLITE VEHICLES, THERMAL INSULATION.) (HIGH TEMPERATURE RESEARCH, SOLDERING ALLOYS, VACUUM FURNACES, TESTS, TEST EQUIPMENT, TOOLS.) (HONEYCOMB CORES, ELECTRON BEAMS, WELDING.) (SHEETS, FOILS, PROCESSING, MECHANICAL PROPERTIES.)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 490 62-2-6 DIV. 26

(PRODUCTION, SHEETS, *MOLYBDENUM ALLOYS, MELTING BY ELECTRON BEAMS, ELECTRIC ARCS, EXTRUSION, ROLLING MILLS.) POWDER ALLOYS, PROCESSING, CRYSTALLIZATION, TEMPERATURE, REDUCTION BY HYDROGEN AND CALCIUM, MECHANICAL PROPERTIES, ALLOYS.
WAH CHANG CORP., ALBANY, OREG.
AD-273 751 64-2-6 DIV. 17

***MOON**

(SIMULATION OF *SPACE ENVIRONMENTAL CONDITIONS ON THE *MOON, *VACUUM SYSTEMS.) (ANALYSIS, TESTS OF IMPACT SHOCK IN *VOLCANIC DUST AND ROCK.) (FEASIBILITY STUDIES AND *TEST METHODS, EXPERIMENTAL DATA, PHOTOGRAPHIC ANALYSIS.) THESES.
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, *RIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 609 62-2-6 DIV. 2

(*MOON, RADIO SIGNALS, VERY HIGH FREQUENCY, RADIOFREQUENCY SPECTRUM ANALYZERS, ELECTROMAGNETIC WAVES, REFLECTION, *EXTRATERRESTRIAL RADIO WAVES, *RADIO ASTRONOMY, *AURORAE.) (*ECHO RANGING, DOPPLER SYSTEMS, PARABOLIC ANTENNAS, *IONOSPHERE, POLARIZATION.) (INSTRUMENTATION, OSCILLATORS, OSCILLATOR CIRCUITS, PARAMETRIC AMPLIFIER, RECORDING DEVICES.)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 686 62-2-6 DIV. 2

(*MOON, *EXTRATERRESTRIAL BASES.) (MOON, MOUNTAINS, VOLCANOES, CRATERS, ROCK, LAVA, VOLCANIC DUST, RILLES.) (MOON, GEOLOGY, MATERIALS.) (MOON, METEORITES.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 816 62-2-6 DIV. 2

(USSR, TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH.) (*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, LIFE EXPECTANCY, SPACE FLIGHT TO *MOON, MARS, VENUS, SUN.) (SPACESHIPS, DECELERATION, *RE-ENTRY AERODYNAMICS.) (UPPER ATMOSPHERE, GEOPHYSICS, *IONOSPHERE.) (PHOTOGRAPHY OF MOON, VAN ALLEN RADIATION BELT.) (BIOLOGY, CONTROLLED ATMOSPHERES, *CLOSED-CYCLE ECOLOGICAL SYSTEMS, DOGS, MANNED PILOTS, TRAINING, AVIATION SAFETY, GLOBAL FLIGHT.)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, *RIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***MOTION**

(HELIUM, HYDROGEN, NEON, NITROGEN, CARBON DIOXIDE, PLATINUM, TUNGSTEN, ENERGY, MOTION, *HEAT TRANSFER, *TEMPERATURE COEFFICIENT OF REACTIVITY.) (MOLECULES, *KINETIC THEORY, METALS, SURFACES.)
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
AD-273 495 62-2-6 DIV. 25

***MOTION SICKNESS**

(*MOTION SICKNESS, STIMULATION, MOTION, ROTATION, ACCELERATION.) (SENSORY PERCEPTION, *SPACE PERCEPTION, EYE, EAR.)
AEROSPACE MEDICAL LAB., AERONAUTICAL SYSTEMS DIV., *RIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 602 62-2-6 DIV. 16

***MUSTARD GAS**

(*MUSTARD GAS, VAPORIZATION, EVAPORATION, PENETRATION, SURFACES, PAINTS, FILMS.) (*CHEMICAL WARFARE AGENTS, *DECONTAMINATION BY CLIMATIC FACTORS, ATMOSPHERE.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 637 62-2-6 DIV. 3

***NAVAL COMMUNICATIONS**

(*RADIO COMMUNICATION SYSTEMS, SIDEBANDS, *POWER AMPLIFIERS, ELECTRON TUBES, AIRBORNE, DESIGN, LINEAR SYSTEMS, MODEL TESTS, MATHEMATICAL ANALYSIS.) (*NAVAL COMMUNICATIONS, *RADIOFREQUENCY AMPLIFIERS, SIDEBANDS, LINEAR SYSTEMS, ELECTRICAL NETWORKS, TESTS.)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 642 62-2-6 DIV. 5

***NAVAL VESSELS**

(LAUNCHING OF SHIPBORNE, SURFACE TO AIR, *GUIDED MISSILES FROM *CRUISERS.) (MEASUREMENT OF EXPLOSION DAMAGE FROM BOOSTER ROCKETS, LAUNCHING TO SHIP BULKHEADS, SHIP DECKS, PERSONNEL.) (GUIDED MISSILE PERSONNEL, *HAZARDS, *BLAST, BOOSTER ROCKETS.) (MEASUREMENT OF POISONOUS GASES, EXHAUST GASES, EXHAUST FLAMES, NOISE FROM BOOSTER ROCKETS.)
*NAVAL VESSELS.
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 779 62-2-6 DIV. 12

***NEODYMIUM**

(*PARAMAGNETIC RESONANCE OF RARE EARTHS, IONS IN CRYSTAL STRUCTURE OF *NEODYMIUM AND *URANIUM, ISOTOPES IN *FLUORSPAR.) (*HYPERFINE STRUCTURE, ATOMIC SPECTRUM, MOLECULAR ROTATION.) (THERMAL DIFFUSION, TRANSPORT PROPERTIES.)
WEBREN U. (ISRAEL).
AD-273 497 62-2-6 DIV. 25

***NEUTRON CAPTURE GAMMA RAYS**

(MEASUREMENT OF *NEUTRON FLUX DENSITY WITH *TRANSISTORS OF SILICON.) (RADIATION COUNTERS, *NEUTRON CAPTURE GAMMA RAYS, THERMAL NEUTRONS, FAST NEUTRONS.) (TRANSISTORS, IONIZATION, RADIATION EFFECTS.) (NEUTRON SCATTERING, DOSIMETERS, RADIATION COUNTERS.)
HUGHES AIRCRAFT CO., CULVER CITY, CALIF.
AD-273 861 62-2-6 DIV. 20

***NEUTRON CROSS SECTIONS**

(*RHENIUM, NUCLEAR REACTIONS, DIOCHEMISTRY, GAMMA-NEUTRON REACTIONS, *NEUTRON CROSS SECTIONS, NUCLEAR PHYSICS.)
FLORIDA U., GAINESVILLE.
AD-273 541 62-2-6 DIV. 20

***NEUTRON FLUX DENSITY**

(MEASUREMENT OF *NEUTRON FLUX DENSITY WITH *TRANSISTORS OF SILICON.) (RADIATION COUNTERS, *NEUTRON CAPTURE GAMMA RAYS, THERMAL NEUTRONS, FAST NEUTRONS.) (TRANSISTORS, IONIZATION, RADIATION EFFECTS.) (NEUTRON SCATTERING, DOSIMETERS, RADIATION COUNTERS.)
HUGHES AIRCRAFT CO., CULVER CITY, CALIF.
AD-273 861 62-2-6 DIV. 20

***NEUTRON SPECTRUM**

(*DIGITAL COMPUTERS, *PROGRAMING OF *SHIELDING, PENETRATION OF *GAMMA RAY, *NEUTRON SPECTRUM FROM LEAKAGE OF *RESEARCH REACTORS.)
GENERAL DYNAMICS/FORT WORTH, TEX.
AD-273 498 62-2-6 DIV. 30

***NEUTRONS**

(*NEUTRONS AND GAMMA RAYS, *SHIELDING, TRANSMISSION, REFLECTION, TRANSPORT PROPERTIES.) (PARTICLES, PENETRATION, EMBEDDING SUBSTANCES.) (MATRIX ALGEBRA, DIFFERENCE EQUATIONS, NUMERICAL ANALYSIS, INTEGRATION.)
GENERAL DYNAMICS/FORT WORTH, TEX.
AD-273 641 62-2-6 DIV. 20

***NICKEL**

(*FERROMAGNETIC MATERIALS, *NICKEL, PARTICLES IN SILICON COMPOUNDS, DIOXIDES, SINGLE CRYSTALS, SURFACES, IRON, *ADSORPTION OF *HYDROGEN, MAGNETIC PROPERTIES, FERROMAGNETISM, SPECTROGRAPHIC ANALYSIS, MICROWAVE SPECTROSCOPY, RADIOFREQUENCY, THEORY.) CATALYSTS.
VARIAN ASSOCIATES, PALO ALTO, CALIF.
AD-273 730 62-2-6 DIV. 25

***NICKEL ALLOYS**

(ALLOYS, SHEETS, *NICKEL ALLOYS (AISI 43-01), CHROMIUM ALLOYS, MANGANESE ALLOYS, COBALT ALLOYS, MANUFACTURING METHODS, PROCESSING, HEAT TREATMENT, AUSTENITE.) (TESTS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, HARDNESS, IMPACT SHOCK, *FRACTURE (MECHANICS), DEFORMATION, GRAINS (METALLURGY), MICROSTRUCTURE, *METALLURGICAL ANALYSIS.)
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 705 62-2-6 DIV. 17

(MATERIALS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, PHYSICAL PROPERTIES, TEST METHODS.) (*ADHESIVES, RESIN ADHESIVES, RUBBER ADHESIVES, LAMINATES, RESINS, PLASTICS, GLASS TEXTILES, *SEALS, *SEALING COMPOUNDS.) (*ALLOYS, *STEEL (4130, 15-7PH, 8360, 300P), *STAINLESS STEEL (AM 350, A286, AM 355, 321, 422, PH 15-7 MO, 17-4 PH), *ALUMINUM ALLOYS (7075-T73, X2219-T61), VANADIUM ALLOYS.) (*HONEYCOMB CORES, SANDWICH CONSTRUCTION, BRAZING, SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X, RENE' 41, M-252, INCONEL 718), CHROMIUM ALLOYS, COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***NICKEL PLATING**

(*PLATING, *CHROMIUM PLATING, *NICKEL PLATING WITHOUT ELECTRODES, *METAL COATINGS, DEPOSITS OF NICKEL ALLOYS, COBALT ALLOYS, CHROMIUM ALLOYS, IRON ALLOYS ON STEEL, MAGNESIUM, ALUMINUM BY CHEMICAL REACTIONS, REDUCTION.) (STANNATES, COATINGS ON MAGNESIUM.)
ALLOYS, METALS.
ROCK ISLAND ARSENAL LAB., ILL.
AD-273 648 62-2-6 DIV. 26

***NIOBIUM ALLOYS**

(*SANDWICH PANELS, MANUFACTURING METHODS, DESIGN, *BRAZING, HONEYCOMB CORES, REFRACTORY MATERIALS, METALS, *MOLYBDENUM ALLOYS, *NIOBIUM ALLOYS, TITANIUM ALLOYS, ZIRCONIUM ALLOYS.) (REFRACTORY COATINGS, SANDWICH CONSTRUCTION, OXIDATION INHIBITORS, HEAT SHIELDING, SPACESHIPS, SATELLITE VEHICLES, THERMAL INSULATION.) (HIGH TEMPERATURE RESEARCH, SOLDERING ALLOYS, VACUUM FURNACES, TESTS, TEST EQUIPMENT, TOOLS.) (HONEYCOMB CORES, ELECTRON BEAMS, WELDING.) (SHEETS, FOILS, PROCESSING, MECHANICAL PROPERTIES.)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 490 62-2-6 DIV. 26

(MANUFACTURING METHODS, *FORGING, *NIOBIUM ALLOYS (CB74), TUNGSTEN ALLOYS, ZIRCONIUM ALLOYS, CASTING, EXTRUSION.) (PROCESSING, POWDER ALLOYS, POWDER METALLURGY, MELTING, ELECTRON BEAMS, ELECTRIC ARCS, VACUUM FURNACES, SHEETS.) TEST METHODS, TENSILE PROPERTIES, STRESSES, RUPTURE, ALLOYS, CRUCIBLE STEEL CO. OF AMERICA, MIDLAND, PA.
AD-273 542 64-2-6 DIV. 26

(MANUFACTURING METHODS, *FORGING, *NIOBIUM ALLOYS (CB74), TUNGSTEN ALLOYS, ZIRCONIUM ALLOYS, TEMPERATURE, DIES, REFRACTORY COATINGS, OXIDATION INHIBITORS, ALUMINUM COMPOUNDS, CHROMIUM COMPOUNDS, SILICON COATINGS.) (EXTRUSION, HEAT TREATMENT, DEFORMATION.) (HIGH TEMPERATURE RESEARCH, TENSILE PROPERTIES, STRESSES, RUPTURE.) NONDESTRUCTIVE TESTING, ULTRASONICS, CRYSTAL STRUCTURES, HARDNESS, CRYSTALLIZATION, MICROSTRUCTURE, SURFACE PROPERTIES.
CRUCIBLE STEEL CO. OF AMERICA, MIDLAND, PA.
AD-273 543 64-2-6 DIV. 26

(*COATINGS, REFRACTORY COATINGS, *OXIDATION INHIBITORS, SILICON COATINGS, *NIOBIUM ALLOYS (D-14), ZIRCONIUM ALLOYS, SHEETS, TESTS.) (COATINGS OF SILICIDES, ALUMINUM AND ALLOYS.) HIGH TEMPERATURE RESEARCH, SPACESHIPS, RE-ENTRY VEHICLES, STRUCTURES, REFRACTORY MATERIALS.
THOMPSON RAMO WOOLDRIDGE, INC., CLEVELAND, OHIO
AD-273 746 62-2-6 DIV. 14

***NITROGEN**

(*REACTION KINETICS, CHEMICAL REACTIONS, COMBUSTION, MIXTURES, *HYDROCARBONS, *OXYGEN, *NITROGEN, *FLAMES.) (ENERGY, CHEMICAL BONDS, *FLAME PROPAGATION, TEMPERATURE.) (BUTANES, PENTANES.) ETHYLENE OXIDE, FUELS.
LOUVAIN U. (BELGIUM).
AD-273 629 62-2-6 DIV. 10

***NITROGEN COMPOUNDS**

(SOLAR FURNACES, PHOTOCHEMISTRY, *PHOTOCHEMICAL REACTIONS, PHOTOLYSIS, CHLORINE, *OXYCHLORIDES, *NITROGEN COMPOUNDS, OXIDES, LIGHT, SOLAR ENERGY, CARBON TETRACHLORIDE.) (*SOLAR CELLS, POWER SUPPLIES.) RECOMBINATION REACTIONS.
STANFORD RESEARCH INST., MENLO PARK, CALIF.
AD-273 662 62-2-6 DIV. 7

(*LIQUID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, ELECTROCHEMISTRY, SYNTHESIS.) (*NITROGEN COMPOUNDS, *OXYFLUORIDES FROM ELECTROLYSIS OF FLUORIDES, HYDROGEN COMPOUNDS, NITROGEN COMPOUNDS, TETROXIDES, NITRIC ACID.) (ELECTRODES, PLATINUM, NICKEL, ELECTROLYTIC CELLS, ELECTRIC POTENTIAL, ELECTRICAL CONDUCTANCE.)
ROCKETDYNE, CANOGA PARK, CALIF.
AD-273 844 64-2-6 DIV. 4

***NUCLEAR ENERGY LEVELS**

(*ELECTRONS, GASES, POTENTIAL THEORY, *ELECTRON TRANSITIONS, *NUCLEAR ENERGY LEVELS.) (NUCLEI, STATISTICAL ANALYSIS.)
WEIZMANN INST. (ISRAEL).
AD-273 697 2-2-6 DIV. 25

***NUCLEAR EXPLOSIONS**

(*METEOROLOGY; *METEOROLOGICAL RADAR; RADAR SIGNALS FOR *RADIOACTIVE FALL-OUT FROM *NUCLEAR EXPLOSIONS.) (*INSTRUMENTATION; METEOROLOGICAL DATA; STORMS; PRECIPITATION.) (DIGITAL COMPUTERS; DATA PROCESSING SYSTEMS; MAGNETIC TAPE.) RESEARCH PROGRAM ADMINISTRATION.
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 481 62-2-6 DIV. 2

(GEOLOGY; *GEOPHYSICS; EARTH; *DEFORMATION BY *NUCLEAR EXPLOSIONS IN SALTS; ROCK.) (*DETONATION WAVES; FRACTURE (MECHANICS); FRAGMENTATION OF TERRAIN.) (*AERIAL PHOTOGRAPHY; EXPERIMENTAL DATA.) NEW MEXICO. STANFORD RESEARCH INST., MENLO PARK, CALIF.
AD-273 519 62-2-6 DIV. 2

(*PHOTOGRAPHIC RECORDING SYSTEMS FOR PHOTOGRAPHIC ANALYSIS OF MOTION OF EARTH SURFACES AFTER *UNDERGROUND EXPLOSIONS; *NUCLEAR EXPLOSIONS, TESTS; EFFECTIVENESS; DATA; TABLES.)
EDGERTON, GERMESHAUSEN AND GRIER, INC., BOSTON, MASS.
AD-273 760 62-2-6 DIV. 24

(FEASIBILITY STUDIES FOR THE DETECTION AND IDENTIFICATION OF *UNDERGROUND EXPLOSIONS.) (*NUCLEAR EXPLOSIONS; SEISMOLOGICAL STATIONS; LOW FREQUENCY; *ELECTROMAGNETIC WAVES; SEISMIC WAVES.) (DETECTION OF ATOMIC BOMB EXPLOSIONS.)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 829 62-2-6 DIV. 20

(DETECTION OF *NUCLEAR EXPLOSIONS BY MEASUREMENT OF SEISMIC WAVES; MICROBARCMETRIC WAVES; MAGNETIC STORMS; NOISE (RADIO) OF EXTREMELY LOW FREQUENCY; VERY LOW FREQUENCY; HIGH FREQUENCY AND VERY HIGH FREQUENCY. RADIO SIGNALS; RADIO SIGNALS FROM SATELLITE VEHICLES; ATTENUATION OF EXTRA-TERRESTRIAL RADIO WAVES AND ATMOSPHERIC SOUNDING.) SWEDEN; INSTRUMENTATION.
KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN).
AD-273 827 62-2-6 DIV. 2

***NUCLEAR MAGNETIC RESONANCE**

(*NUCLEAR MAGNETIC RESONANCE IN EXHAUST GASES AND *EXHAUST FLAMES FROM JET ENGINES.) (THERMAL RADIATION *NUCLEAR SPINS; NUCLEAR STATES; QUANTUM MECHANICS; EXCITATION.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 736 62-2-6 DIV. 20

***NUCLEAR SPINS**

(*NUCLEAR MAGNETIC RESONANCE IN EXHAUST GASES AND *EXHAUST FLAMES FROM JET ENGINES.) (THERMAL RADIATION *NUCLEAR SPINS; NUCLEAR STATES; QUANTUM MECHANICS; EXCITATION.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 736 62-2-6 DIV. 20

***NUCLEONS**

(*COSMIC RAYS; INELASTIC SCATTERING.) (PROTON SCATTERING OF *NUCLEONS IN NUCLEI; COSMIC RAYS.) MESONS.
SPACE TECHNOLOGY LABS., INC., LOS ANGELES, CALIF.
AD-273 651 62-2-6 DIV. 20

***OCEANOGRAPHICAL DATA**

(*OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS, ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY OF SEA WATER.)
OCEANOGRAPHICAL CHARTS.
WASHINGTON U., SEATTLE.
AD-273 524 62-2-6 DIV. 2

(*TABLES FOR *OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS; ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY; SEA WATER.) (WEATHER FORECASTING; WIND; CLOUDS; VISIBILITY.)
WASHINGTON U., SEATTLE.
AD-273 525 62-2-6 DIV. 2

***OCEANOGRAPHY**

(*OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS, ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY OF SEA WATER.)
OCEANOGRAPHICAL CHARTS.
WASHINGTON U., SEATTLE.
AD-273 524 62-2-6 DIV. 2

(*TABLES FOR *OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS; ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY; SEA WATER.) (WEATHER FORECASTING; WIND; CLOUDS; VISIBILITY.)
WASHINGTON U., SEATTLE.
AD-273 525 62-2-6 DIV. 2

(*BIBLIOGRAPHY; *ANTISUBMARINE WARFARE; *SUBMARINES; *TORPEDOES; *OCEANOGRAPHY.) (UNDERSEA WARFARE; CONTROL SYSTEMS; NUCLEAR PROPULSION; SUBMARINE PERISCOPES; SUBMARINE NOISE.)
AUTONETICS, DOWNEY, CALIF.
AD-273 660 62-2-6 DIV. 31

***OCEANS**

(*SEA WATER; *DENSITY IN THE *OCEANS AS A METHOD OF DEPTH FINDING FOR *PRESSURE VESSELS; DESIGN.)
NAVAL ORDNANCE LAB., WHITE OAK, MD.
AD-273 634 62-2-6 DIV. 2

***OPERATIONS RESEARCH**

(*OPERATIONS RESEARCH; *COMMUNICATIONS THEORY; MILITARY COMMUNICATIONS; EFFECTIVENESS; MEASUREMENT; ERRORS.) (MILITARY ORGANIZATIONS; LANGUAGE; INTELLIGIBILITY; CONTROL.)
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
AD-273 546 62-2-6 DIV. 5

***OPERATORS (MATHEMATICS)**

(*ELECTRICAL NETWORKS; LINEAR SYSTEMS; *NONLINEAR SYSTEMS; ANALYSIS BY *OPERATORS (MATHEMATICS); DIGITAL COMPUTERS.) (*ELECTRONIC CIRCUITS; DIODES; TRANSISTORS; ELECTRON TUBES; MATHEMATICAL ANALYSIS; THEORY; PROGRAMMING.)
STANFORD ELECTRONICS LABS., STANFORD U., CALIF.
AD-273 849 62-2-6 DIV. 8

***OPTICAL EQUIPMENT**

(*VIDEO NETWORKS; DESIGN OF *OPTICAL EQUIPMENT; PHOTOELECTRIC CELLS; PHOTOGRAPHIC FILM; OPTICAL FILTERS; FLASH LAMPS.) (*MATHEMATICAL LOGIC; SEQUENCES; ERRORS; ANALYSIS.)
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
AD-273 536 62-2-6 DIV. 25

***OPTICAL FILTERS**

(*OPTICAL FILTERS FOR IMPROVING RESOLUTION OF LIGHT PULSES FROM *MINE DETECTORS; *MAGNETIC DETECTORS.) (MINES; DETECTION.) CORRELATION TECHNIQUES; MATHEMATICAL ANALYSIS; TRANSFORMATIONS (MATHEMATICS); SAMPLING.
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 549 62-2-6 DIV. 6

***OPTICAL TRACKING**

(*RADIO ASTRONOMY; *INTERFEROMETERS; *OPTICAL TRACKING OF *SATELLITE VEHICLES; SPACE FLIGHT.) (CALIBRATION; OPTICAL EQUIPMENT; RADIO SIGNALS; SIGNAL-TO-NOISE RATIO.) (ORBITAL FLIGHT PATHS OF GALAXIES; *STARS.) CELESTIAL MECHANICS.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 498 62-2-6 DIV. 2

(RE-ENTRY VEHICLES; *OPTICAL TRACKING; *INFRARED TRACKING; SHIPBORNE.) (*ATMOSPHERE; SKY BRIGHTNESS; SOLAR ENERGY; BLACKBODY RADIATION; DENSITY; ABSORPTION; SCATTERING; *ATTENUATION; *WAVE TRANSMISSION; MEASUREMENT; OPTICAL ANALYSIS.) (ATMOSPHERE MODELS; INSTRUMENTATION.) *GUIDED MISSILE TRACKING SYSTEMS.
BARNES ENGINEERING CO., STAMFORD, CONN.
AD-273 612 62-2-6 DIV. 6

***ORBITAL FLIGHT PATHS**

(SATELLITE VEHICLES; SPACESHIPS; *ORBITAL FLIGHT PATHS; SEPARATION; TAKE-OFF; SPACE FLIGHT; *CELESTIAL MECHANICS; DYNAMICS; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; INTEGRAL EQUATIONS; BESSEL FUNCTIONS; PERTURBATION THEORY.) (MOTION; EQUATIONS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 479 62-2-6 DIV. 12

***ORGANIC COATINGS**

(RADIATION EFFECTS OF *ULTRAVIOLET RADIATION IN A VACUUM ON *PLASTIC PAINTS AND *PLASTIC COATINGS CONTAINING ZINC COMPOUNDS; SULFIDES; ALUMINUM; TITANIUM COMPOUNDS; DIOXIDES; LEAD COMPOUNDS; CARBONATES; SILICONE RESINS; ACRYLIC RESINS.) (*ORGANIC COATINGS FOR CONTROL OF TEMPERATURE WITHIN SPACESHIPS.) (REFLECTION OF ULTRAVIOLET RADIATION.) (OPTICS; ORGANIC COATINGS.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 716 2-2-6 DIV. 14

***ORGANIC COMPOUNDS**

(*ORGANIC MATERIALS; *SEMICONDUCTORS; *ORGANIC COMPOUNDS; POLYMERS; CONDUCTIVITY; ELECTRICAL PROPERTIES; THEORY; SOLID STATE PHYSICS,) BENZENES; *BIBLIOGRAPHY; PLASTICS LAB., PRINCETON U., N. J.
AD-273 720 2-2-6 DIV. 14

(*SEMICONDUCTORS; *ORGANIC MATERIALS; *ORGANIC COMPOUNDS; *POLYMERS; SYNTHESIS; MOLECULAR STRUCTURE; CONDUCTIVITY; RESISTANCE; HALL EFFECT; THERMOELECTRICITY; PHOTOCONDUCTIVITY; *ELECTRONS; SPIN; STABILITY.) (QUINONES; ANTHRACENES; NAPHTHALENES; PHENANTHRENES; BENZENES; FERROCENES; ANILINE.)
PLASTICS LAB., PRINCETON U., N. J.
AD-273 723 2-2-6 DIV. 4

(*ORGANIC COMPOUNDS; *SEMICONDUCTORS; POLYMERS; *SYNTHESIS; CHEMICAL REACTIONS; *QUINONES; *CYANO RADICALS; PHENYL RADICALS; METHANES; OXIMES; BENZONITRILES; BENZENES; ETHYLENES; HYDROXIDES.) (ELECTRICAL PROPERTIES; ELECTRICAL CONDUCTANCE; PHOTOELECTRIC EFFECT; RADIOFREQUENCY.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 836 62-2-6 DIV. 4

***ORGANIC MATERIALS**

(*ORGANIC MATERIALS; *SEMICONDUCTORS; *ORGANIC COMPOUNDS; POLYMERS; CONDUCTIVITY; ELECTRICAL PROPERTIES; THEORY; SOLID STATE PHYSICS,) BENZENES; *BIBLIOGRAPHY; PLASTICS LAB., PRINCETON U., N. J.
AD-273 720 2-2-6 DIV. 14

(*SEMICONDUCTORS; *ORGANIC MATERIALS; *ORGANIC COMPOUNDS; *POLYMERS; SYNTHESIS; MOLECULAR STRUCTURE; CONDUCTIVITY; RESISTANCE; HALL EFFECT; THERMOELECTRICITY; PHOTOCONDUCTIVITY; ELECTRONS; SPIN; STABILITY,) (QUINONES; ANTHRACENES; NAPHTHALENES; PHENANTHRENES; BENZENES; FERROCENES; ANILINE.)
PLASTICS LAB., PRINCETON U., N. J.
AD-273 723 2-2-6 DIV. 4

***ORGANOBORANES**

(*BORGHYDRIDES; *ORGANOBORANES; *PENTABORANES; DEUTERATED COMPOUNDS; SYNTHESIS; NUCLEAR MAGNETIC RESONANCE; MOLECULAR STRUCTURE.) (PENTABORANES; CHEMICAL REACTIONS; BUTENES; PENTENES; CATALYSTS; METHYL RADICALS; PYRIDINES.)
LOS ANGELES STATE COLL., CALIF.
AD-273 469 62-2-6 DIV. 4

***OXIDATION INHIBITORS**

(*COATINGS; REFRACTORY COATINGS; *OXIDATION INHIBITORS; SILICON COATINGS; *NIOBIUM ALLOYS (D-14); ZIRCONIUM ALLOYS; SHEETS, TESTS,) (COATINGS OF SILICIDES; ALUMINUM AND ALLOYS,) HIGH TEMPERATURE RESEARCH; SPACESHIPS; RE-ENTRY VEHICLES; STRUCTURES; REFRACTORY MATERIALS.
THOMPSON RAMO WOOLDRIDGE, INC., CLEVELAND, OHIO
AD-273 746 62-2-6 DIV. 14

***OXIDE CATHODES**

(*ELECTRON BEAMS; *LINEAR SYSTEMS; *ELECTRON TUBES; MICROWAVE FREQUENCY THEORY.) (ELECTRON BEAMS; TEST EQUIPMENT.) *OXIDE CATHODES; *CATHODES (ELECTRON TUBES); *DIODES.
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 806 62-2-6 DIV. 8

(*CATHODES (ELECTRON TUBES); *OXIDE CATHODES; SEMICONDUCTORS, COATINGS; BARIUM COMPOUNDS; OXIDES, THIN FILMS,) (THERMIONIC EMISSION; ULTRAVIOLET RADIATION; TESTS,) (ELECTRONS, NONLINEAR SYSTEMS; TANTALUM COMPOUNDS; OXIDES; ALUMINUM; ALUMINUM COMPOUNDS; MEASUREMENT,)
ELECTRON TUBE RESEARCH LAB., U. OF MINN., MINNEAPOLIS.
AD-273 873 62-2-6 DIV. 8

***OXIDES**

(*RADOMES; CERAMIC MATERIALS; *ALUMINUM COMPOUNDS, *OXIDES; MANUFACTURING METHODS; PROCESSING, MOLDING, CASTING; HEAT TREATMENT; INDUSTRIAL EQUIPMENT; HYDRAULIC PRESSES,) (PHYSICAL PROPERTIES; ELECTRICAL PROPERTIES,)
SHENANGO CHINA, INC., NEW CASTLE, PA.
AD-273 584 62-2-6 DIV. 6

(*TESTS AND DESIGN OF *MASERS BY *TUNED AMPLIFIERS,) (ANALYSIS BY *LOW TEMPERATURE RESEARCH; MATERIALS OF CRYSTALS; *OXIDES; *TITANIUM COMPOUNDS WITH CHROMIUM; THIN FILMS,) (*WAVEGUIDES; FERRITES; DIELECTRICS; FERROMAGNETIC MATERIALS,)
AIRBORNE INSTRUMENTS LAB., INC., MINEOLA, N. Y.
AD-273 846 62-2-6 DIV. 25

***OXIDIZERS**

(*BORON; *COMBUSTION; CHEMICAL REACTIONS; FLUORINE, *OXIDIZERS; OXIDATION; REACTION KINETICS; *BORON COMPOUNDS; FLUORIDES; MASS SPECTROSCOPY; TEMPERATURE, HIGH TEMPERATURE RESEARCH,)
TEXACO EXPERIMENT INC., RICHMOND, VA.
AD-273 733 2-2-6 DIV. 4

***OXYCHLORIDES**

(SOLAR FURNACES, PHOTOCHEMISTRY, *PHOTOCHEMICAL REACTIONS, PHOTOLYSIS, CHLORINE, *OXYCHLORIDES, *NITROGEN COMPOUNDS, OXIDES, LIGHT, SOLAR ENERGY, CARBON TETRACHLORIDE,) (*SOLAR CELLS, POWER SUPPLIES,) RECOMBINATION REACTIONS.
STANFORD RESEARCH INST., MENLO PARK, CALIF.
AD-273 662 62-2-6 DIV. 7

***OXYFLUORIDES**

(*OXYFLUORIDES AND *CHLORIDES, SYNTHESIS FROM OXYFLUORIDES AND FLUORIDES OF CHLORINE COMPOUNDS, BROMINE COMPOUNDS, SULFUR COMPOUNDS, CHEMICAL REACTIONS,) (PHYSICAL PROPERTIES, CHEMICAL PROPERTIES, SOLUBILITY, STABILITY, TEMPERATURE, ELECTRICAL PROPERTIES, LOW TEMPERATURE RESEARCH, ULTRAVIOLET SPECTROSCOPY,) ELECTRIC DISCHARGES.
RESEARCH INST., TEMPLE U., PHILADELPHIA, PA.
AD-273 732 2-2-6 DIV. 4

(*LIQUID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, ELECTROCHEMISTRY, SYNTHESIS,) (*NITROGEN COMPOUNDS, *OXYFLUORIDES FROM ELECTROLYSIS OF FLUORIDES, HYDROGEN COMPOUNDS, NITROGEN COMPOUNDS, TETROXIDES, NITRIC ACID,) (ELECTRODES, PLATINUM, NICKEL, ELECTROLYTIC CELLS, ELECTRIC POTENTIAL, ELECTRICAL CONDUCTANCE,)
ROCKETDYNE, CANOGA PARK, CALIF.
AD-273 844 62-2-6 DIV. 4

***OXYGEN**

(*OXYGEN CONSUMPTION, DOSAGE, TEMPERATURE, PRESSURE, SURVIVAL, LABORATORY ANIMALS,) (*OXYGEN, *TOXICITY, PATHOLOGY, RESPIRATORY SYSTEM,)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS.,
ARMY CHEMICAL CENTER, MD.
AD-273 485 62-2-6 DIV. 16

(*LIQUEFIED GASES, *OXYGEN, CHEMICAL REACTIONS WITH *TITANIUM, *COMBUSTION, PRESSURE,) (OXIDATION INHIBITORS, HYDROGEN COMPOUNDS, FLUORIDES GAS OR ARGON AND COATINGS OF PHOSPHATES OR VAPOR PLATING, ALUMINUM,)
LIQUID ROCKET PROPELLANTS, METALS,
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
AD-273 489 62-2-6 DIV. 10

(*REACTION KINETICS, CHEMICAL REACTIONS, COMBUSTION, MIXTURES, *HYDROCARBONS, *OXYGEN, *NITROGEN, *FLAMES,) (ENERGY, CHEMICAL BONDS, *FLAME PROPAGATION, TEMPERATURE,) (BUTANES, PENTANES,) ETHYLENE OXIDE, FUELS,
LOUVAIN U. (BELGIUM),
AD-273 629 62-2-6 DIV. 10

***OXYGEN CONSUMPTION**

(*OXYGEN CONSUMPTION, DOSAGE, TEMPERATURE, PRESSURE, SURVIVAL, LABORATORY ANIMALS,) (*OXYGEN, *TOXICITY, PATHOLOGY, RESPIRATORY SYSTEM,)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS.,
ARMY CHEMICAL CENTER, MD.
AD-273 485 62-2-6 DIV. 16

(*PRESSURE BREATHING, *OXYGEN CONSUMPTION, BLOOD CIRCULATION, BLOOD PRESSURE,) (HEART, ARTERIES,) (PRESSURE SUITS, RESISTANCE,) (BLOOD VOLUME, MEASUREMENT, INSTRUMENTATION,)
OHIO STATE U. RESEARCH FOUNDATION, COLUMBUS,
AD-273 513 62-2-6 DIV. 16

(*MEDICAL RESEARCH, *OXYGEN CONSUMPTION, *AVIATION PERSONNEL,) (ALTITUDE CHAMBERS, LOW PRESSURE RESEARCH, NAVAL PERSONNEL, DIET, METABOLISM, SLEEP, BLOOD, METABOLIC PRODUCTS, SIMULATION,)
NAVAL MISSILE AND ASTRONAUTICS CENTER, POINT MUGU, CALIF.
AD-273 863 62-2-6 DIV. 16

***PACKAGING**

(*SYMPOSIA: *SHOCK: *VIBRATION: *PACKAGING: *TRANSPORTATION: MEASUREMENT: SIMULATION: DESIGN.) (RAILROADS: RAILROAD TRACKS: RAILROAD CARS: CARGO: SHIPPING.) (*MILITARY TRANSPORTATION: CARGO VEHICLES: TERRAIN: ROADS: SAILS.) (PACKAGING: CONTAINERS: STORAGE: MATERIALS: FOAM RUBBER: FOAPS: CELLULOSE: HANDLING: GUIDED MISSILES: NUCLEAR POWER PLANTS: DESIGN: TRAILERS: ELECTRONIC EQUIPMENT.) (AIR TRANSPORTATION: AIR DROP OPERATIONS: AIRBORNE: CONTAINERS.)
ASSISTANT SECRETARYY OF DEFENSE: RESEARCH AND ENGINEERING: WASHINGTON: D. C.
AD-273 815 62-2-6 DIV. 11

(*TRANSISTORS: GERMANIUM: SILICON: SEMICONDUCTORS: *PACKAGING: *SUBMINIATURE ELECTRONIC EQUIPMENT: PRODUCTION: *MANUFACTURING METHODS: DESIGN: TESTS.)
SYLVANIA ELECTRIC PRODUCTS: INC.: WOBURN: MASS.
AD-273 848 62-2-6 DIV. 5

***PANEL BOARDS (ELECTRICITY)**

(*MILITARY COMMUNICATIONS: *COMMUNICATION SYSTEMS: DESIGN: *VOICE COMMUNICATION SYSTEMS: *TELEPHONE COMMUNICATION SYSTEMS: FACSIMILE COMMUNICATION SYSTEMS.) (*COMMUNICATION EQUIPMENT: MAINTENANCE: RELIABILITY: FACSIMILE TRANSMISSION.) (CODING: PULSE MODULATION: AUDITORY SIGNALS.) *PANEL BOARDS (ELECTRICITY).
BELL TELEPHONE LABS., INC.: WHIPPANY: N. J.
AD-273 683 62-2-6 DIV. 5

***PARAMAGNETIC RESONANCE**

(*PARAMAGNETIC RESONANCE OF RARE EARTH: IONS IN CRYSTAL STRUCTURE OF *NEODYMIUM AND *URANIUM: ISOTOPES IN *FLUORSPAR.) (*HYPERFINE STRUCTURE: ATOMIC SPECTRUM: MOLECULAR ROTATION.) (THERMAL DIFFUSION: TRANSPORT PROPERTIES.)
HEBREW U. (ISRAEL).
AD-273 497 62-2-6 DIV. 25

***PARAMETRIC AMPLIFIERS**

(*PARAMETHIC AMPLIFIERS: *DIODES: ELECTRICAL PROPERTIES: ELECTRONIC CIRCUITS: IMPEDANCE MEASUREMENT.) (PICROWAVE AMPLIFIERS: SEMICONDUCTORS: MATERIALS: NONLINEAR SYSTEMS: THEORY: MATHEMATICAL ANALYSIS: COMPUTERS.)
NORWEGIAN DEFENCE RESEARCH ESTABLISHMENT.
AD-273 572 62-2-6 DIV. 8

(*PARAMETRIC AMPLIFIERS: FERROMAGNETIC MATERIALS: *FERROMAGNETISM.) (AMPLIFIERS: THEORY.)
AEROSPACE CORP.: LOS ANGELES: CALIF.
AD-273 598 62-2-6 DIV. 8

***PARTICLES**

(TERMINAL BALLISTICS: *CRATERING: EFFECTS OF MYLAR: PLASTICS: COPPER AND ALUMINUM: *HYPERVELOCITY PROJECTILES AND DISCSHAPED *PARTICLES ON LEAD: TARGETS.) (HYPERVELOCITY GUNS: INSTRUMENTATION FOR ACCELERATION OF PARTICLES.) HIGH-SPEED PHOTOGRAPHY: PHOTOGRAPHIC ANALYSIS: CAPACITORS.
TECHNICAL OPERATIONS: INC.: BURLINGTON: MASS.
AD-273 493 62-2-6 DIV. 22

(*PENETRATION OF *PARTICLES INTO *SOLIDS: SOLID STATE PHYSICS.) (ENERGY: WAVE TRANSMISSION: ELASTIC SCATTERING.) (PLASTICITY: DEFORMATION: ELASTICITY: *STRESSES: SHEAR STRESSES: *PHASE TRANSITIONS.) (HYDRODYNAMICS: JETS.) (CRATERING AND IMPACT SHOCK OF METEORITES.)
NAVAL ORDNANCE TEST STATION: CHINA LAKE: CALIF.
AD-273 718 2-2-6 DIV. 25

***PENETRATION**

(*PENETRATION OF *PARTICLES INTO *SOLIDS: SOLID STATE PHYSICS.) (ENERGY: WAVE TRANSMISSION: ELASTIC SCATTERING.) (PLASTICITY: DEFORMATION: ELASTICITY: *STRESSES: SHEAR STRESSES: *PHASE TRANSITIONS.) (HYDRODYNAMICS: JETS.) (CRATERING AND IMPACT SHOCK OF METEORITES.)
NAVAL ORDNANCE TEST STATION: CHINA LAKE: CALIF.
AD-273 718 2-2-6 DIV. 25

***PENTABORANES**

(*BORONHYDRIDES: *ORGANOBORANES: *PENTABORANES: DEUTERATED COMPOUNDS: SYNTHESIS: NUCLEAR MAGNETIC RESONANCE: MOLECULAR STRUCTURE.) (PENTABORANES: CHEMICAL REACTIONS: BUTENES: PENTENES: CATALYSTS: METHYL RADICALS: PYRIDINES.)
LOS ANGELES STATE COLL.: CALIF.
AD-273 469 62-2-6 DIV. 4

(*PENT...HANES: *TOXICITY: RESPIRATION: DOSAGE: LABORATORY ANIMALS: SURVIVAL.)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS.: ARMY CHEMICAL CENTER: MD.
AD-273 484 62-2-6 DIV. 10

***PHASE SHIFTERS**

(*PHASE SHIFTERS: TRIODES: DIGITAL SYSTEMS: *SWITCHING CIRCUITS: PHASE MEASUREMENT: L BAND: ULTRA HIGH FREQUENCY: ELECTRONIC SWITCHES: DESIGN.) (RADAR ANTENNAS: *TRANSMISSION LINES: ELECTRONIC CIRCUITS: NARROWBAND: RADAR EQUIPMENT: DESIGN.)
NAVAL RESEARCH LAB.: WASHINGTON: D. C.
AD-273 631 62-2-6 DIV. 8

***PHASE TRANSITIONS**

(*PENETRATION OF *PARTICLES INTO *SOLIDS: SOLID STATE PHYSICS.) (ENERGY: WAVE TRANSMISSION: ELASTIC SCATTERING.) (PLASTICITY: DEFORMATION: ELASTICITY: *STRESSES: SHEAR STRESSES: *PHASE TRANSITIONS.) (HYDRODYNAMICS: JETS.) (CRATERING AND IMPACT SHOCK OF METEORITES.)
NAVAL ORDNANCE TEST STATION: CHINA LAKE: CALIF.
AD-273 718 2-2-6 DIV. 25

(*URANIUM COMPOUNDS: OXIDES: OXIDATION-REDUCTION REACTIONS: DECOMPOSITION: *PHASE TRANSITIONS: PHASE STUDIES: X-RAY DIFFRACTION ANALYSIS: REACTION KINETICS.)
USSR.
FOREIGN TECH. DIV.: AIR FORCE SYSTEMS COMMAND: WRIGHT-PATTERSON AIR FORCE BASE: OHIO.
AD-273 881 62-2-6 DIV. 4

***PHOSPHIDES**

(HIGH TEMPERATURE RESEARCH: *SEMICONDUCTORS: *GALLIUM COMPOUNDS: *ARSENIDES: *PHOSPHIDES: INTERMETALLIC COMPOUNDS.) (CRYSTALS: GROWTH: CRYSTALLIZATION: PRESSURE: ELECTRICAL PROPERTIES: RESISTANCE.) (TRANSPORT PROPERTIES: ARSENIC: VAPORS: CHEMICAL IMPURITIES: CARBON.)
DAVID SARNOFF RESEARCH CENTER: PRINCETON: N. J.
AD-273 845 62-2-6 DIV. 25

***PHOTOCHEMICAL REACTIONS**

(SOLAR FURNACES: PHOTOCHEMISTRY: *PHOTOCHEMICAL REACTIONS: PHOTOLYSIS: CHLORINE: *OXYCHLORIDES: *NITROGEN COMPOUNDS: OXIDES: LIGHT: SOLAR ENERGY: CARBON TETRACHLORIDE.) (*SOLAR CELLS: POWER SUPPLIES.) RECOMBINATION REACTIONS.
STANFORD RESEARCH INST.: MENLO PARK: CALIF.
AD-273 662 62-2-6 DIV. 7

***PHOTOELECTRIC CELLS**

(*PHOTOELECTRIC CELLS: *SOLAR CELLS: GALLIUM COMPOUNDS: ARSENIDES: PHOSPHIDES: MANUFACTURING METHODS: DIFFUSION.) *ELECTRIC POWER PRODUCTION: POWER SUPPLIES: SOLAR ENERGY: THERMOELECTRICITY.
EAGLE-PICHER RESEARCH LABS.: MIAMI: OKLA.
AD-273 807 62-2-6 DIV. 7

***PHOTOENGRAVING**

(*PHOTOENGRAVING: PROCESSING: PRODUCTION: *MANUFACTURING METHODS: SOLID STATE PHYSICS: ELECTRONIC EQUIPMENT: TRANSISTORS: SILICON.) SEMICONDUCTORS: MATERIALS: RESISTANCE: TEST METHODS: TESTS.
DIAMOND ORDNANCE FUZE LABS.: WASHINGTON: D. C.
AD-273 618 62-2-6 DIV. 26

***PHOTOGRAPHIC ANALYSIS**

(*INTERFEROMETERS: *PHOTOGRAPHIC ANALYSIS OF IGNITION AND DETONATION OF GASES.) (*MIXTURES OF HYDROGEN AND OXYGEN.) (ACCELERATION OF *FLAMES IN EXPLOSIVE GASES.)
CALIFORNIA U.: BERKELEY.
AD-273 684 62-2-6 DIV. 10

(*PHOTOGRAPHIC ANALYSIS OF *CAVITATION OBTAINED FROM MODEL TESTS OF THE WATER EXIT OF *GUIDED MISSILES.) (LAUNCHING: GUIDED MISSILES: UNDERWATER TO SURFACE.)
NAVAL ORDNANCE TEST STATION: CHINA LAKE: CALIF.
AD-273 717 2-2-6 DIV. 22

***PHOTOGRAPHIC EQUIPMENT**

(*PHOTOTHEODOLITES: *CALIBRATION: ERRORS: STANDARDS.) (COLLIMATORS: *PHOTOGRAPHIC EQUIPMENT: INSTRUMENTATION: AZIMUTH: RECORDING DEVICES: MEASUREMENT.) (TRIGONOMETRY: LEAST SQUARES METHOD: HARMONIC ANALYSIS: TRANSFORMATIONS: MATRIX ALGEBRA.)
NAVAL ORDNANCE TEST STATION: CHINA LAKE: CALIF.
AD-273 635 62-2-6 DIV. 24

***PHOTOGRAPHIC RECORDING SYSTEMS**

(*PHOTOGRAPHIC RECORDING SYSTEMS FOR PHOTOGRAPHIC ANALYSIS OF MOTION OF EARTH SURFACES AFTER *UNDERGROUND EXPLOSIONS: *NUCLEAR EXPLOSIONS: TESTS: EFFECTIVENESS: DATA: TABLES.)
EDGERTON, GERMESHAUSEN AND GRIER, INC.: BOSTON: MASS.
AD-273 780 62-2-6 DIV. 24

***PHOTOMETERS**

(MEASUREMENT OF *TWILIGHT WITH *PHOTOMETERS.) (MEASUREMENT OF DENSITY OF PARTICLES IN ATMOSPHERE AT TWILIGHT.) (ATMOSPHERE: OPTICS.)
BLUE HILL METEOROLOGICAL OBSERVATORY: HARVARD U.: MILTON: MASS.
AD-273 857 62-2-6 DIV. 2

***PHOTOMULTIPLIERS**

(*PHOTONUCLEAR REACTION: *PRODUCTION OF *POSITIVE PIONS FROM *HYDROGEN: NUCLEAR PHYSICS.) (MATRIX ALGEBRA: SCATTERING: BREMSSTRAHLUNG: SPECTROGRAPHIC ANALYSIS: MESONS.) (*POSITRONS: RADIOACTIVE DECAY: COUNTING METHODS: *PHOTOMULTIPLIERS.)
ILLINOIS U.: URBANA.
AD-273 899 62-2-6 DIV. 20

***PHOTOTHEODOLITES**

(*PHOTOTHEODOLITES: *CALIBRATION: ERRORS: STANDARDS.) (COLLIMATORS: *PHOTOGRAPHIC EQUIPMENT: INSTRUMENTATION: AZIMUTH: RECORDING DEVICES: MEASUREMENT.) (TRIGONOMETRY: LEAST SQUARES METHOD: HARMONIC ANALYSIS: TRANSFORMATIONS: MATRIX ALGEBRA.)
NAVAL ORDNANCE TEST STATION: CHINA LAKE: CALIF.
AD-273 635 62-2-6 DIV. 24

***PHYSICAL PROPERTIES**

(FEASIBILITY STUDIES OF *PHYSICAL PROPERTIES OF *DIPOLE ANTENNAS.) (MEASUREMENT OF ADMITTANCE: ELECTRICAL CONDUCTANCE: ELECTROSTATIC CAPACITANCE: ELECTRIC CURRENTS.) (STORAGE TANKS: *LIQUIDS: WATER.) (*EXPERIMENTAL DATA: TABLES.)
GORDON MCKAY LAB. OF APPLIED SCIENCE: HARVARD U.: CAMBRIDGE: MASS.
AD-273 687 62-2-6 DIV. 8

(MATERIALS: *PHYSICAL PROPERTIES: THERMODYNAMICS: CORROSION: MECHANICAL PROPERTIES: TEST METHODS.) (*ABLATION: *COATINGS: ELECTRIC INSULATION: *GLASS TEXTILES: GRAPHITE: LAMINATES: ENCAPSULATION: EPOXIDING SUBSTANCES: *ZIRCONIUM COMPOUNDS: DIOXIDES.) (*STAINLESS STEEL (PH15-7MO): HONEYCOMB CORES: SANDWICH PANELS.) (*TOOL STEEL (HGR PUNCH AND DIE: OLYMPIC FM DIE, SELECT B DIE: JET FORGE TOOL: VASCO 7152 TOOL: CK SPECIAL TOOL): DIES.)
CHANCE VOUGHT CORP., DALLAS: TEX.
AD-273 801 62-2-6 DIV. 14

***PIEZOELECTRIC TRANSDUCERS**

(*SHROUDED PROPELLERS: *AERIAL PROPELLERS: AERODYNAMICS: PRESSURE: TRANSIENTS: TURBULENCE: INSTRUMENTATION.) (*PRESSURE GAGES: *PIEZOELECTRIC TRANSDUCERS: HARMONIC ANALYSIS: DESIGN: TESTS.) (PROPELLER NOISE: VIBRATION: TURBULENT BOUNDARY LAYER: INSTRUMENTATION.)
THERM, INC.: ITHACA, N. Y.
AD-273 747 62-2-6 DIV. 9

***PILOTS**

(*PILOTS: *BEHAVIOR: MEASUREMENT: FLIGHT INSTRUMENTS: CONTROL SYSTEMS: COCKPITS.) (DYNAMICS: MOTOR REACTIONS: REACTION (PSYCHOLOGY).) MATHEMATICAL COMPUTER DATA.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION: WASHINGTON: D. C.
AD-273 460 62-2-6 DIV. 28

***PIONS**

(*PHOTONUCLEAR REACTION: *PRODUCTION OF *POSITIVE PIONS FROM *HYDROGEN: NUCLEAR PHYSICS.) (MATRIX ALGEBRA: SCATTERING: BREMSSTRAHLUNG: SPECTROGRAPHIC ANALYSIS: MESONS.) (*POSITRONS: RADIOACTIVE DECAY: COUNTING METHODS: *PHOTOMULTIPLIERS.)
ILLINOIS U.: URBANA.
AD-273 499 62-2-6 DIV. 20

***PLASMA JETS**

(MEASUREMENT OF GAS FLOW BY SENSITIVITY OF *ELECTRICAL CONDUCTANCE: *INSTRUMENTATION: CALIBRATION.) (TRANSDUCERS: TESTS: STANDARDS OF *ABLATION: *MATERIALS: *ELECTRICAL PROPERTIES.) (*PLASMA JETS: GAS IONIZATION IN RE-ENTRY AERODYNAMICS.)
AEROSPACE CORP.: LOS ANGELES: CALIF.
AD-273 591 62-2-6 DIV. 25

(*PLASMA JETS: RADIOFREQUENCY: DESIGN FOR USE IN SYNTHESIS OF CYANOGEN: HYDROCYANIC ACIDS: ACETYLENES AND NITROGEN COMPOUNDS: OXIDES: *CHEMICAL REACTIONS: REDUCTION OF ALUMINUM COMPOUNDS: OXIDES.)
RESEARCH INST.: TEMPLE U.: PHILADELPHIA: PA.
AD-273 799 62-2-6 DIV. 25

(*LOW TEMPERATURE RESEARCH ON *PLASMA JETS.) (RESEARCH PROGRAM ADMINISTRATION: *ABSTRACTING OF SCIENTIFIC RESEARCH RELATED TO EXPERIMENTAL DATA AND THEORY OF

ENERGY. *TRANSPORT PROPERTIES AND IONIZATION OF *GAS FLOW.) BIBLIOGRAPHY.
AEROCHEM RESEARCH LABS., INC., PRINCETON, N. J.
AD-273 889 62-2-6 DIV. 25

***PLASMA OSCILLATIONS**

INTERACTIONS BETWEEN *PLASMA OSCILLATIONS AND VELOCITY MODULATION. *ELECTRON BEAMS.) (*HARMONIC ANALYSIS. BESSEL FUNCTIONS. PARTIAL DIFFERENTIAL EQUATIONS. NONLINEAR SYSTEMS.) (CATHODE RAY TUBES. KLYSTRONS. DIELECTRICS.)
MICROWAVE LAB., STANFORD U., CALIF.
AD-273 708 2-2-6 DIV. 25

(*HIGH FREQUENCY. *PLASMA OSCILLATIONS OF ELECTRONS. LOW PRESSURE RESEARCH IN *GAS DISCHARGES.) (*ELECTRON BEAMS. SCATTERING. EXCITATION.) (*DISCHARGE TUBES. CATHODES. AMPLIFIERS. ELECTRODES. OSCILLOSCOPE PROBES. RADIO RECEIVERS.) USSR. FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND. *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 884 62-2-6 DIV. 25

***PLASMA PHYSICS**

(*SATELLITE VEHICLES. *GUIDED MISSILES. SURFACE TO SURFACE. RADAR TRACKING. RADIO INTERFEROMETERS. *TRACKING.) *PLASMA PHYSICS. *ELECTROMAGNETIC FIELDS. WAVE TRANSMISSION. ELECTROMAGNETIC WAVES. MAGNETOHYDRODYNAMICS. *IONOSPHERIC DISTURBANCES. IONS. IONOSPHERE. UPPER ATMOSPHERE. *RADIO ASTRONOMY. RADIO WAVES. EXTRATERRESTRIAL RADIO WAVES. ANTENNA RADIATION PATTERNS. USSR.
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 937 62-2-6 DIV. 12

(*IONS. *THRUST AUGMENTOR NOZZLES. TESTS. *ELECTRONS.) (ROCKET MOTOR PRESSURE. TEMPERATURE MEASUREMENT.) (*SPECTROGRAPHIC ANALYSIS. OPTICS. DETECTION. BLACKBODY RADIATION.) (*GAS FLOW. *PLASMA PHYSICS.) (NUMERICAL ANALYSIS. INTEGRAL EQUATIONS.)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 940 62-2-6 DIV. 20

(*PLASMA PHYSICS. MEASUREMENT OF *TEMPERATURE.) (BLACKBODY RADIATION. SPECTROGRAPHIC ANALYSIS.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 990 62-2-6 DIV. 25

(*MICROWAVE PROBES. *PLASMA PHYSICS. *ANTENNAS. WAVEGUIDE WINDOWS.) (*REFLECTOMETERS. OSCILLOGRAMS. WAVEGUIDES. ATTENUATION.) (INSTRUMENTATION. DESIGN UNDER FLIGHT TESTING.) (BOUNDARY LAYER. SHOCK WAVES. PROPAGATION. WAVE TRANSMISSION.)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 740 62-2-6 DIV. 25

(*PLASMA PHYSICS. MEASUREMENT BY *MICROWAVE PROBES. THEORY.) (GAS DISCHARGES. ELECTRONS. IONS. TRANSPORT PROPERTIES.) (PHYSICAL PROPERTIES. DIFFUSION. EXCITATION. IONIZATION. TEMPERATURE. CONDUCTIVITY.) (LEAST SQUARES METHOD. PERTURBATION THEORY.)
ARMY ORDNANCE MISSILE COMMAND, REDSTONE ARSENAL, HUNTSVILLE, ALA.
AD-273 787 62-2-6 DIV. 25

(*PLASMA PHYSICS. MEASUREMENT BY *CAVITY RESONATORS. MICROWAVE EQUIPMENT. *RADIOFREQUENCY POWER. *MICROWAVE PROBES.) (FERRITES. MAGNETRONS. KLYSTRONS. OSCILLOGRAMS. FREQUENCY MODULATION. QUARTZ RESONATORS. WAVEGUIDES.) (ANALYSIS. PERTURBATION THEORY. ELECTRONS. DENSITY.)
RESEARCH LAB. OF ELECTRONICS, MASS. INST. OF TECH., CAMBRIDGE.
AD-273 830 62-2-6 DIV. 25

***PLASTIC COATINGS**

(*STEEL. *COATINGS. *PLASTIC COATINGS. RESINS. POLYMERS. FLUORIDES. ETHYLENES. SURFACES. SANDBLASTING. ADHESION. CORROSION INHIBITION. LUBRICATION. TESTS.)
NAVAL WEAPONS PLANT, WASHINGTON, D. C.
AD-273 716 2-2-6 DIV. 14

(RADIATION EFFECTS OF *ULTRAVIOLET RADIATION IN A VACUUM ON *PLASTIC PAINTS AND *PLASTIC COATINGS CONTAINING ZINC COMPOUNDS. SULFIDES. ALUMINUM. TITANIUM COMPOUNDS. DIOXIDES. LEAD COMPOUNDS. CARBONATES. SILICONE RESINS. ACRYLIC RESINS.) (*ORGANIC COATINGS FOR CONTROL OF TEMPERATURE WITHIN SPACESHIPS.) (REFLECTION OF ULTRAVIOLET RADIATION.) (OPTICS. ORGANIC COATINGS.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 716 2-2-6 DIV. 14

***PLASTIC PAINTS**

(RADIATION EFFECTS OF *ULTRAVIOLET RADIATION IN A VACUUM ON *PLASTIC PAINTS AND *PLASTIC COATINGS CONTAINING ZINC COMPOUNDS. SULFIDES. ALUMINUM. TITANIUM COMPOUNDS. DIOXIDES. LEAD COMPOUNDS. CARBONATES. SILICONE RESINS. ACRYLIC RESINS.) (*ORGANIC COATINGS FOR CONTROL OF TEMPERATURE WITHIN SPACESHIPS.) (REFLECTION OF ULTRAVIOLET RADIATION.) (OPTICS. ORGANIC COATINGS.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 716 2-2-6 DIV. 14

***PLASTICITY**

(*FATIGUE (MECHANICS). SOLIDS. *ELASTICITY. *PLASTICITY. *DEFORMATION. *SHEETS. STRESSES. SHEAR STRESSES. LOAD DISTRIBUTION. MATHEMATICAL ANALYSIS. EQUATIONS.)
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 832 62-2-6 DIV. 25

***PLASTICS**

(*MATERIALS FOR SPACESHIPS AND SATELLITE VEHICLES. *REFRACTORY MATERIALS. *ALLOYS. *COATINGS. METALLIC TEXTILES. SOLID ROCKET PROPELLANTS. *METALS. FOAMS. BERYLLIUM COMPOUNDS. OXIDES. OPTICS. ABLATION. *PLASTICS. *ELASTOMERS. ADHESIVES. FILAMENT WOUND CONSTRUCTION. CRYOGENICS. SHIELDING.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 876 62-2-6 DIV. 14

(*HANDBOOKS. *LAMINATES. *PLASTICS. POLYMERS. ESTERS. REINFORCING MATERIALS. GLASS. *BONDING. ADHESIVES. RESIN ADHESIVES. *JOINTS. BOLTS. RIVETS. METAL SCREWS.) (LAMINATES. MECHANICAL PROPERTIES. TENSILE PROPERTIES. THICKNESS.) *INSTRUCTION MANUALS.
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
AD-273 961 62-2-6 DIV. 14

***PLATING**

(*PLATING. *CHROMIUM PLATING. *NICKEL PLATING WITHOUT ELECTRODES. *METAL COATINGS. DEPOSITS OF NICKEL ALLOYS. COBALT ALLOYS. CHROMIUM ALLOYS. IRON ALLOYS ON STEEL. MAGNESIUM. ALUMINUM BY CHEMICAL REACTIONS. REDUCTION.) (STANNATES. COATINGS ON MAGNESIUM.) ALLOYS. METALS.
ROCK ISLAND ARSENAL LAB., ILL.
AD-273 648 62-2-6 DIV. 26

***POLYMERS**

(*POLYMERS. BUTENES. STYRENES. ETHYLENES. SULFIDES. PROPENES. FURAN. BUTADIENES. RUBBER. ACRYLIC RESINS.) (DEFORMATION. *VISCOSITY. *ELASTICITY. STRESSES. RELAXATION TIME. TEMPERATURE.) TABLES.
FRICK CHEMICAL LAB., PRINCETON U., N. J.
AD-273 575 62-2-6 DIV. 14

(*POLYMERS. RESINS. ION EXCHANGE RESINS. *ESTERS. *AMIDES. ORGANIC ACIDS. SYNTHESIS. CHEMICAL REACTIONS. REACTION KINETICS. HYDROLYSIS. IONS.) (HYDROXIDES. METHYL RADICALS. ANILINES. ACETYL RADICALS. AMINES. ETHYL RADICALS. HYDROGEN COMPOUNDS. PHTHALATES. CARBOXYLIC ACIDS. PHENYL RADICALS.) (ENZYMES. CHLORINESTERASE.)
POLYTECHNIC INST. OF BROOKLYN, N. Y.
AD-273 649 62-2-6 DIV. 14

(*SEMICONDUCTORS. *ORGANIC MATERIALS. *ORGANIC COMPOUNDS. *POLYMERS. SYNTHESIS. MOLECULAR STRUCTURE. CONDUCTIVITY. RESISTANCE. HALL EFFECT. THERMOELECTRICITY. PHOTOCONDUCTIVITY. ELECTRONS. SPIN. STABILITY.) (QUINONES. ANTHRACENES. NAPHTHALENES. PHENANTHRENES. BENZENES. FERROCENES. ANILINE.)
PLASTICS LAB., PRINCETON U., N. J.
AD-273 723 2-2-6 DIV. 6

***POSITRONS**

(*PHOTONUCLEAR REACTION. *PRODUCTION OF *POSITIVE PIONS FROM *HYDROGEN. NUCLEAR PHYSICS.) (MATRIX ALGEBRA. SCATTERING. BREMSSTRAHLUNG. SPECTROGRAPHIC ANALYSIS. MESONS.) (*POSITRONS. RADIOACTIVE DECAY. COUNTING METHODS. *PHOTOMULTIPLIERS.)
ILLINOIS U., URBANA.
AD-273 699 62-2-6 DIV. 20

***POWDERS**

(*STEREOCHEMISTRY. *X-RAY DIFFRACTION ANALYSIS. *POWDERS. *COMPLEX COMPOUNDS. *COMPLEX IONS. TRANSITION ELEMENTS. ARSINES. PYRIDINES. HALIDES. *CHELATE COMPOUNDS. CHROMIUM COMPOUNDS. MOLYBDENUM COMPOUNDS. TUNGSTEN COMPOUNDS. MOLECULAR STRUCTURE.)
UNIVERSITY COLL., LONDON (GT. BRIT.).
AD-273 654 62-2-6 DIV. 25

***POWER AMPLIFIERS**

(*RADIO COMMUNICATION SYSTEMS. SIDEBANDS. *POWER AMPLIFIERS. ELECTRON TUBES. AIRBORNE. DESIGN. LINEAR SYSTEMS. MODEL TESTS. MATHEMATICAL ANALYSIS.) (*NAVAL COMMUNICATIONS. *RADIOFREQUENCY AMPLIFIERS. SIDEBANDS. LINEAR SYSTEMS. ELECTRICAL NETWORKS. TESTS.)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 642 62-2-6 DIV. 5

(*POWER TRANSFORMERS. TRANSFORMERS. *POWER AMPLIFIERS. LOW FREQUENCY. VERY LOW FREQUENCY. OSCILLATOR CIRCUITS. MATERIALS. CERAMIC MATERIALS. FERROELECTRIC MATERIALS. PIEZOELECTRIC MATERIALS. MANUFACTURING METHODS.) (BARIUM COMPOUNDS. TITANATES.) ELECTRONIC EQUIPMENT.
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
AD-273 819 62-2-6 DIV. 8

(*POWER AMPLIFIERS. SUPERHIGH FREQUENCY. *FERRITES. MAGNETIC FIELDS. POLARIZATION. MATHEMATICAL ANALYSIS. NONLINEAR DIFFERENTIAL EQUATIONS. LINEAR DIFFERENTIAL EQUATIONS.) (USSR. RADAR SIGNALS. RADIO SIGNALS. AMPLIFIERS.)
FOREIGN TECH. DIV. AIR FORCE SYSTEMS COMMAND, *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 882 62-2-6 DIV. 8

***POWER SUPPLIES**

(*POWER SUPPLIES. *THERMIONIC EMISSION. SEALS. ELECTRIC INSULATION. CERAMIC MATERIALS. REFRACTORY MATERIALS. METALLIC COMPOUNDS. OXIDES. BORON COMPOUNDS. NITRIDES. ZIRCONIUM COMPOUNDS. SILICATES.) (PHYSICAL PROPERTIES. DENSITY. MECHANICAL PROPERTIES. ELECTRICAL PROPERTIES. RESISTANCE. THERMODYNAMICS. NEUTRON CROSS SECTIONS. NEUTRON CAPTURE. THERMAL CONDUCTIVITY. STABILITY.) BIBLIOGRAPHY.
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
AD-273 681 62-2-6 DIV. 7

(*POWER SUPPLIES. *ELECTRIC POWER PRODUCTION. DIRECT CURRENT. ELECTRONIC EQUIPMENT. ELECTRICAL EQUIPMENT FOR FLOATING BODIES IN THE OCEANS.) (FUEL CELLS. DRY CELLS. STORAGE BATTERIES. THERMOELECTRICITY. LIQUEFIED GASES. *GENERATORS. INTERNAL COMBUSTION ENGINES. COSTS. RELIABILITY. DESIGN FOR NAVAL EQUIPMENT.)
KAYE, JOSEPH, AND CO., INC., CAMBRIDGE, MASS.
AD-273 556 62-2-6 DIV. 7

(*POWER SUPPLIES. *ELECTRIC POWER PRODUCTION. DIRECT CURRENT. ELECTRONIC EQUIPMENT. ELECTRICAL EQUIPMENT FOR FLOATING BODIES IN THE OCEANS.) PRIMARY BATTERIES. STORAGE BATTERIES. SEA WATER BATTERIES. FUEL CELLS. MAGNETOHYDRODYNAMICS. SOLID STATE PHYSICS. SOLAR ENERGY. THERMOELECTRICITY. *GENERATORS.
KAYE, JOSEPH, AND CO., INC., CAMBRIDGE, MASS.
AD-273 557 62-2-6 DIV. 7

(*BIBLIOGRAPHY. *POWER SUPPLIES. INDEXES. AUXILIARY POWER PLANTS. ALKALINE CELLS. DRY CELLS. GUIDED MISSILE BATTERIES. FUEL CELLS. STORAGE BATTERIES. SOLAR CELLS. SOLAR ENERGY. MAGNETOHYDRODYNAMICS. GENERATORS. THERMOELECTRICITY. SPACESHIPS. THERMIONIC EMISSION. THERMOPILES. LUBRICANTS. GREASES. HIGH TEMPERATURE RESEARCH.) (GAS GENERATING SYSTEMS. SERVO SYSTEMS.) (TITANIUM ALLOYS. ROLLING MILLS.) (STEEL. EXTRUSION. MECHANICAL PROPERTIES.) (AIRFRAMES. STAINLESS STEEL.) (TITANIUM TUBING. NIOBIUM ALLOYS. BERYLLIUM.) (REFRACTORY COATINGS. PLASTICS. REINFORCING MATERIALS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 676 62-2-6 DIV. 7

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AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 677 62-2-6 DIV. 7

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AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 678 62-2-6 DIV. 7

(*BIBLIOGRAPHY. *POWER SUPPLIES. INDEXES. AUXILIARY POWER PLANTS. ALKALINE CELLS. DRY CELLS. GUIDED MISSILE BATTERIES. FUEL CELLS. STORAGE BATTERIES. MAGNETOHYDRODYNAMICS. GENERATORS. SPACESHIPS. SOLAR CELLS. SOLAR ENERGY. THERMIONIC EMISSION. THERMOELECTRICITY. THERMOPILES. LUBRICANTS. HIGH TEMPERATURE RESEARCH. GREASES.) (GAS GENERATING SYSTEMS. SERVO SYSTEMS.) (TITANIUM ALLOYS. ROLLING MILLS.) (STEEL. EXTRUSION. MECHANICAL PROPERTIES.) (AIRFRAMES. STAINLESS STEEL.) (TITANIUM TUBING. NIOBIUM ALLOYS. BERYLLIUM.) (REFRACTORY COATINGS. PLASTICS. REINFORCING MATERIALS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 679 62-2-6 DIV. 7

(*LUNAR PROBES: MOBILE: *POWER SUPPLIES: *AUXILIARY POWER PLANTS.) (SOLAR CELLS OF SILICON: THERMOELECTRICITY: NUCLEAR POWER PLANTS: ELECTRIC POWER PRODUCTION: STORAGE BATTERIES: PRIMARY BATTERIES: ELECTROCHEMISTRY: THERMIONIC EMISSION.) (MOON: SURFACE PROPERTIES: *SPACE ENVIRONMENTAL CONDITIONS: EXPLORATION.)
GENERAL ELECTRIC CO,: SANTA BARBARA: CALIF.
AD-273 811 62-2-6 DIV. 12

(*ELECTRIC POWER PRODUCTION: *POWER SUPPLIES: *THERMOELECTRICITY: *THERMIONIC EMISSION: *FUEL CELLS: GENERATORS: *VOLTAGE REGULATORS: SWITCHING CIRCUITS: CONTROL SYSTEMS: INVERTED RECTIFIERS: TRANSISTORS, RECTIFIERS: STABILITY: DESIGN.) (POWER SUPPLIES: SOURCES: VOLTAGE: IMPEDANCE: ELECTRONIC CIRCUITS: SEMICONDUCTORS: TESTS.)
GENERAL ELECTRIC CO,: WEST LYNN: MASS.
AD-273 869 62-2-6 DIV. 7

***POWER TRANSFORMERS**

(*POWER TRANSFORMERS: TRANSFORMERS: *POWER AMPLIFIERS: LOW FREQUENCY: VERY LOW FREQUENCY: OSCILLATOR CIRCUITS: MATERIALS: CERAMIC MATERIALS: FERROELECTRIC MATERIALS, PIEZOELECTRIC MATERIALS: MANUFACTURING METHODS.) (BARIUM COMPOUNDS: TITANATES.) ELECTRONIC EQUIPMENT.
GENERAL ELECTRIC CO,: SYRACUSE: N. Y.
AD-273 819 62-2-6 DIV. 9

***PRECIPITATION**

(*ATMOSPHERE: *CLOUDS: *AEROSOLS: GASES: CONDENSATION: NUCLEI: *PRECIPITATION: SEDIMENTATION: DIFFUSION: WASH-OUT.) GERMANY, JOHANN WOLFGANG GOETHE U. (GERMANY).
AD-273 765 62-2-6 DIV. 2

***PRECISION FINISHING**

(ALLOYS: *STEEL (A-286: AM-350: POTOMAC TYPE 422: ALTEMP R-41): *SHEETS FOR AIRFRAMES.) (MANUFACTURING METHODS: PROCESSING: MELTING: HEAT TREATMENT: ROLLING MILLS: *PRECISION FINISHING: WELDING: *THICKNESS GAGES: QUALITY CONTROL.) TABLES.
ALLEGHENY LUDLUM STEEL CORP.: BRACKENRIDGE: PA.
AD-273 938 62-2-6 DIV. 26

***PRESSURE BREATHING**

(*PRESSURE BREATHING: *OXYGEN CONSUMPTION: BLOOD CIRCULATION: BLOOD PRESSURE.) (HEART: ARTERIES.) (*PRESSURE SUITS: RESISTANCE.) (BLOOD VOLUME: MEASUREMENT: INSTRUMENTATION.)
OHIO STATE U. RESEARCH FOUNDATION: COLUMBUS.
AD-273 513 62-2-6 DIV. 16

***PRESSURE GAGES**

(*SHROUDED PROPELLERS: *AERIAL PROPELLERS: AERODYNAMICS: PRESSURE: TRANSIENTS: TURBULENCE: INSTRUMENTATION.) (*PRESSURE GAGES: *PIEZOELECTRIC TRANSDUCERS: HARMONIC ANALYSIS: DESIGN: TESTS.) (PROPELLER NOISE: VIBRATION: TURBULENT BOUNDARY LAYER: INSTRUMENTATION.)
THERM, INC.: ITHACA: N. Y.
AD-273 747 62-2-6 DIV. 9

***PRESSURE VESSELS**

(*SEA WATER: *DENSITY IN THE *OCEANS AS A METHOD OF DEPTH FINDING FOR *PRESSURE VESSELS: DESIGN.)
NAVAL ORDNANCE LAB., WHITE OAK, MD.
AD-273 634 62-2-6 DIV. 2

***PRODUCTION**

(*PHOTONUCLEAR REACTION: *PRODUCTION OF *POSITIVE PIONS FROM *HYDROGEN: NUCLEAR PHYSICS.) (MATRIX ALGEBRA: SCATTERING: BREMSSTRAHLUNG: SPECTROGRAPHIC ANALYSIS: MESONS.) (*POSITRONS: RADIOACTIVE DECAY: COUNTING METHODS: *PHOTOMULTIPLIERS.)
ILLINOIS U., URBANA.
AD-273 499 62-2-6 DIV. 20

(HIGH TEMPERATURE RESEARCH: SILICON COMPOUNDS: CARBIDES: *CRYSTAL RECTIFIERS: ELECTRONIC EQUIPMENT: GUIDED MISSILES: SATELLITE VEHICLES: SUPERSONIC PLANES.) (RECTIFIERS: *CRYSTALS: *PRODUCTION: *MANUFACTURING METHODS: ENCAPSULATION: SUBLIMATION: PYROLYSIS.)
WESTINGHOUSE ELECTRIC CORP.: DAYTON: OHIO.
AD-273 589 62-2-6 DIV. 8

***PROGRAMMING**

(TERRAIN: *ROADS: *VEHICLES: MOTION: SIMULATION ON *DIGITAL COMPUTERS.) *VEHICLE WHEELS: *PROGRAMMING: COMPUTERS.
ORDNANCE TANK-AUTOMOTIVE COMMAND: DETROIT: MICH.
AD-273 487 62-2-6 DIV. 11

(*DIGITAL COMPUTERS: *PROGRAMMING OF *SHIELDING: PENETRATION OF *GAMMA RAY: *NEUTRON SPECTRUM FROM LEAKAGE OF *RESEARCH REACTORS.)
GENERAL DYNAMICS/FORT WORTH: TEX.
AD-273 498 62-2-6 DIV. 30

(*SINGLE CRYSTALS: *X-RAY DIFFRACTION ANALYSIS: CRYSTAL STRUCTURE: GONIOMETERS.) (*DATA PROCESSING SYSTEMS: COMPUTERS: *PROGRAMMING: PUNCHED CARD METHODS.) (CAMERAS: PHOTOGRAPHS BY REFLECTION.) (ERRORS: ANALYSIS.)
NAVAL RESEARCH LAB., WASHINGTON: D. C.
AD-273 719 2-2-6 DIV. 30

***PROPAGATION**

(THEORY OF *PROPAGATION OF *ELECTROMAGNETIC WAVES AROUND *SPHERES: EARTH.) (*TERRESTRIAL MAGNETISM: CONDUCTIVITY, DIELECTRICS: ATTENUATION.) (*WAVE ANALYSIS: POLYNOMIALS: INTEGRAL EQUATIONS: TRANSFORMATIONS (MATHEMATICS).) NUMERICAL ANALYSIS BY COMPUTERS.
NATIONAL BUREAU OF STANDARDS: BOULDER: COLO.
AD-273 483 62-2-6 DIV. 25

***PROTECTIVE CLOTHING**

(*PROTECTIVE CLOTHING: *GOGGLES: ROCKET LAUNCHERS: SAFETY DEVICES.)
AMMUNITION GROUP: PICATINNY ARSENAL: COVER: N. J.
AD-273 722 2-2-6 DIV. 29

***QUANTUM MECHANICS**

(*ELECTRONS: DENSITY IN *METALS AND *GASES.) (WAVE ANALYSIS: *QUANTUM MECHANICS: NUCLEAR SPINS: ATOMIC ORBITALS: LATTICES: THEORY.)
SHEFFIELD U. (GT. BRIT.).
AD-273 793 62-2-6 DIV. 25

***QUINONES**

(*ORGANIC COMPOUNDS: *SEMICONDUCTORS: POLYMERS: *SYNTHESIS: CHEMICAL REACTIONS: *QUINONES: *CYANO RADICALS: PHENYL RADICALS: METHANES: OXIMES: BENZONITRILES: BENZENES: ETHYLENES: HYDROXIDES.) (ELECTRICAL PROPERTIES: ELECTRICAL CONDUCTANCE: PHOTOELECTRIC EFFECT: RADIOFREQUENCY.)
AEROSPACE CORP.: LOS ANGELES: CALIF.
AD-273 836 62-2-6 DIV. 4

***RADAR ANTENNAS**

(*LENS ANTENNAS: ELECTROMAGNETIC LENSES: MICROWAVE EQUIPMENT: DESIGN FOR *RADAR ANTENNAS: RADAR SCANNING: THEORY: MATHEMATICAL ANALYSIS.) (PARABOLIC ANTENNAS: COUPLED ANTENNAS: TRANSMISSION LINES,: COAXIAL CABLES: MICROWAVE FREQUENCY.)
AIR FORCE CAMBRIDGE RESEARCH LABS.: BEDFORD: MASS.
AD-273 811 62-2-6 DIV. 8

***RADAR BEACONS**

(*AIR TRAFFIC CONTROL SYSTEMS: *CIVIL AVIATION: *RADAR NAVIGATION: *RADAR BEACONS: AUTOMATIC: *RADAR TRACKING: RADAR SIGNALS: *DATA PROCESSING SYSTEMS: CODING: DISPLAY SYSTEMS: EFFECTIVENESS: ANALYSIS.) (AERIAL TARGETS: FLIGHT PATHS: RADAR TRACKING: IDENTIFICATION SYSTEMS: POSITION FINDING: RELIABILITY.)
AIRBORNE INSTRUMENTS LAB.: INC.: DEER PARK: LONG ISLAND: N. Y.
AD-273 742 62-2-6 DIV. 6

(*AVIATION SAFETY: *AVIATION ACCIDENTS: COUNTERMEASURES: AIRCRAFT EQUIPMENT: ELECTRONIC EQUIPMENT: RADIO EQUIPMENT: *RADAR BEACONS: DESIGN: ELECTRONIC CIRCUITS.) (RADIO TRANSMITTERS: DISCRIMINATORS: POWER SUPPLIES: RADIO RECEIVERS: DATA PROCESSING SYSTEMS: DISPLAY SYSTEMS: ELECTRONIC CIRCUITS: DESIGN.) PROGRAMMING: CODING.
POTOROLA: INC.: RIVERSIDE: CALIF.
AD-273 831 62-2-6 DIV. 1

***RADAR NAVIGATION**

(*GROUND-CONTROLLED APPROACH RADAR: *AIRPORT RADAR SYSTEMS: AUTOMATIC PILOTS: *TRANSPORT PLANES: *RADAR NAVIGATION: AUTOMATIC: RELIABILITY: FLIGHT TESTING.) (RADAR SIGNALS: DATA PROCESSING SYSTEMS: DATA TRANSMISSION SYSTEMS: *RADIO NAVIGATION: TESTS.) (*ALL-WEATHER AVIATION: LANDING: INSTRUMENT LANDING: RADAR EQUIPMENT: RADIO EQUIPMENT.)
BELL AEROSYSTEMS CO.: BUFFALO: N. Y.
AD-273 538 62-2-6 DIV. 19

(*AIR TRAFFIC CONTROL SYSTEMS: *CIVIL AVIATION: *RADAR NAVIGATION: *RADAR BEACONS: AUTOMATIC: *RADAR TRACKING: RADAR SIGNALS: *DATA PROCESSING SYSTEMS: CODING: DISPLAY SYSTEMS: EFFECTIVENESS: ANALYSIS.) (AERIAL TARGETS: FLIGHT PATHS: RADAR TRACKING: IDENTIFICATION SYSTEMS: POSITION FINDING: RELIABILITY.)
AIRBORNE INSTRUMENTS LAB.: INC.: DEER PARK: LONG ISLAND: N. Y.
AD-273 742 62-2-6 DIV. 6

***RADAR SCANNING**

(DESIGN: *ELECTRONIC SCANNERS FOR ELECTROMAGNETIC WAVES: POLARIZATION: TRACKING *WITH S BAND: CONICAL ANTENNAS.) (X BAND: *RADAR TRACKING BY FERRITES: ROTATING STRUCTURES: TESTS ON RADAR ANTENNAS: *RADAR SCANNING.)
ELECTRONIC DEFENSE LAB.: MOUNTAIN VIEW: CALIF.
AD-273 731 2-2-6 DIV. 8

***RADAR STATIONS**

(SPACESHIPS: SPACE PROBES: LUNAR PROBES: SPACE FLIGHT: *RADAR TRACKING: GUIDED MISSILE TRACKING SYSTEMS: RADIO ASTRONOMY: *DOPPLER TRACKING: DOPPLER SYSTEMS: COMMAND SYSTEMS: TELEMETER SYSTEMS: COMMUNICATION SYSTEMS: DATA PROCESSING SYSTEMS: INSTRUMENTATION: *RADAR STATIONS.)
GENERAL ELECTRIC CO,: SANTA BARBARA: CALIF.
AD-273 813 62-2-6 DIV. 6

***RADAR TRACKING**

(DESIGN: *ELECTRONIC SCANNERS FOR ELECTROMAGNETIC WAVES: POLARIZATION: TRACKING *WITH S BAND: CONICAL ANTENNAS.) (X BAND: *RADAR TRACKING BY FERRITES: ROTATING STRUCTURES: TESTS ON RADAR ANTENNAS: *RADAR SCANNING.)
ELECTRONIC DEFENSE LAB.: MOUNTAIN VIEW: CALIF.
AD-273 731 2-2-6 DIV. 8

(*AIR TRAFFIC CONTROL SYSTEMS: *CIVIL AVIATION: *RADAR NAVIGATION: *RADAR BEACONS: AUTOMATIC: *RADAR TRACKING: RADAR SIGNALS: *DATA PROCESSING SYSTEMS: CODING: DISPLAY SYSTEMS: EFFECTIVENESS: ANALYSIS.) (AERIAL TARGETS: FLIGHT PATHS: RADAR TRACKING: IDENTIFICATION SYSTEMS: POSITION FINDING: RELIABILITY.)
AIRBORNE INSTRUMENTS LAB.: INC.: DEER PARK: LONG ISLAND: N. Y.
AD-273 742 62-2-6 DIV. 6

(SPACESHIPS: SPACE PROBES: LUNAR PROBES: SPACE FLIGHT: *RADAR TRACKING: GUIDED MISSILE TRACKING SYSTEMS: RADIO ASTRONOMY: *DOPPLER TRACKING: DOPPLER SYSTEMS: COMMAND SYSTEMS: TELEMETER SYSTEMS: COMMUNICATION SYSTEMS: DATA PROCESSING SYSTEMS: INSTRUMENTATION: *RADAR STATIONS.)
GENERAL ELECTRIC CO,: SANTA BARBARA: CALIF.
AD-273 813 62-2-6 DIV. 6

***RADAR TRANSMITTERS**

(FREQUENCY: CONTROL OF AN EXTREMELY HIGH FREQUENCY: *KLYSTRONS: *MICROWAVE OSCILLATORS.) (*RADAR TRANSMITTERS: MICROWAVE FREQUENCY, DESIGN: STABILIZATION SYSTEMS: PHASE STUDIES: STABILIZATION.)
LINCOLN LAB.: MASS. INST. OF TECH.: LEXINGTON.
AD-273 909 62-2-6 DIV. 8

***RADIATION COUNTERS**

(RADIOFREQUENCY: *INTERFERENCE IN *RADIATION COUNTERS: RECORDING DEVICES FROM *TELEMETERING TRANSMITTERS: TESTS: MEASUREMENT.) (TELEMETER SYSTEMS: *RADIO EQUIPMENT: TELEMETERING DATA: RADIOLOGICAL CONTAMINATION: ERRORS: RELIABILITY.)
NAVAL RADIOLOGICAL DEFENSE LAB.: SAN FRANCISCO: CALIF.
AD-273 452 62-2-6 DIV. 20

***RADIATION EFFECTS**

(*BIBLIOGRAPHY: *RADIATION EFFECTS: RADIATION DAMAGE: ELECTRONICS: POLYMERS: METALS: ORGANIC COMPOUNDS: INORGANIC SUBSTANCES: DOSIMETERS.)
RADIATION EFFECTS INFORMATION CENTER: COLUMBUS: OHIO.
AD-273 539 62-2-6 DIV. 20

(*VULCANIZATES: ADDITIVES: *ELASTOMERS: *RADIOACTIVATION ANALYSIS: *RUBBER: *RADIATION EFFECTS: GAMMA EMISSION.)
NAVAL RADIOLOGICAL DEFENSE LAB.: SAN FRANCISCO: CALIF.
AD-273 636 2-2-6 DIV. 20

***RADIATION INJURIES**

(*RADIATION INJURIES: FAST NEUTRONS: DOSE RATE, ANALYSIS.) (*X-RAYS: RADIATION TOLERANCE: MEASUREMENT.)
NAVAL RADIOLOGICAL DEFENSE LAB.: SAN FRANCISCO: CALIF.
AD-273 633 62-2-6 DIV. 20

***RADIO ASTRONOMY**

(*RADIO ASTRONOMY, *INTERFEROMETERS, *OPTICAL TRACKING OF *SATELLITE VEHICLES, SPACE FLIGHT,) (CALIBRATION, OPTICAL EQUIPMENT, RADIO SIGNALS, SIGNAL-TO-NOISE RATIO,) (ORBITAL FLIGHT PATHS OF GALAXIES, *STARS,) CELESTIAL MECHANICS.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 458 62-2-6 DIV. 2

(*SATELLITE VEHICLES, *GUIDED MISSILES, SURFACE TO SURFACE, RADAR TRACKING, RADIO INTERFEROMETERS, *TRACKING,) *PLASMA PHYSICS, *ELECTROMAGNETIC FIELDS, WAVE TRANSMISSION, ELECTROMAGNETIC WAVES, MAGNETOHYDRODYNAMICS, *IONOSPHERIC DISTURBANCES, IONS, IONOSPHERE, UPPER ATMOSPHERE, *RADIO ASTRONOMY, RADIO WAVES, EXTRATERRESTRIAL RADIO WAVES, ANTENNA RADIATION PATTERNS, USSR,
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 937 62-2-6 DIV. 12

(*MOON, RADIO SIGNALS, VERY HIGH FREQUENCY, RADIOFREQUENCY SPECTRUM ANALYZERS, ELECTROMAGNETIC WAVES, REFLECTION, *EXTRATERRESTRIAL RADIO WAVES, *RADIO ASTRONOMY, *AURORAE,) (*ECHO RANGING, DOPPLER SYSTEMS, PARABOLIC ANTENNAS, *IONOSPHERE, POLARIZATION,) (INSTRUMENTATION, OSCILLATORS, OSCILLATOR CIRCUITS, PARAMETRIC AMPLIFIER, RECORDING DEVICES,)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 686 62-2-6 DIV. 2

(*INTERFEROMETERS, VERY HIGH FREQUENCY,) (*SOLAR DISTURBANCES, SOLAR NOISE, MEASUREMENT, RADIO SIGNALS, PHASE MEASUREMENT, POSITION FINDING,) *RADIO ASTRONOMY,
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 798 62-2-6 DIV. 2

***RADIO COMMUNICATION SYSTEMS**

(*RADIO COMMUNICATION SYSTEMS, SIDEBANDS, *POWER AMPLIFIERS, ELECTRON TUBES, AIRBORNE, DESIGN, LINEAR SYSTEMS, MODEL TESTS, MATHEMATICAL ANALYSIS,) (*NAVAL COMMUNICATIONS, *RADIOFREQUENCY AMPLIFIERS, SIDEBANDS, LINEAR SYSTEMS, ELECTRICAL NETWORKS, TESTS,)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 642 62-2-6 DIV. 5

(*LUNAR PROBES, MOBILE, COMMUNICATION EQUIPMENT,) (*RADIO COMMUNICATION SYSTEMS, *TELEVISION COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PULSE MODULATION, CODING, MATHEMATICAL ANALYSIS,) (RADIOFREQUENCY POWER OF *RADIO TRANSMITTERS, ANTENNAS FOR RADIO RECEIVERS,) (MOON TO EARTH, COMMUNICATION SYSTEMS,)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 812 62-2-6 DIV. 12

(*AIR FORCE COMMUNICATIONS, *RADIO RELAY STATIONS, *RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, *RADIO COMMUNICATION SYSTEMS, *DATA TRANSMISSION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS, *VOICE COMMUNICATION SYSTEMS, RADIO RECEIVERS, TELETYPE SYSTEMS,) (COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, ANALOG TO DIGITAL CONVERTERS, DATA STORAGE SYSTEMS, DATA PROCESSING SYSTEMS,) RADIO SIGNALS, REFLECTIONS,
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

***RADIO EQUIPMENT**

(RADIOFREQUENCY, *INTERFERENCE IN *RADIATION COUNTERS, RECORDING DEVICES FROM *TELEMETERING TRANSMITTERS, TESTS, MEASUREMENT,) (TELEMETER SYSTEMS, *RADIO EQUIPMENT, TELEMETERING DATA, RADIOLOGICAL CONTAMINATION, ERRORS, RELIABILITY,)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 432 62-2-6 DIV. 20

***RADIO NAVIGATION**

(*GROUND-CONTROLLED APPROACH RADAR, *AIRPORT RADAR SYSTEMS, AUTOMATIC PILOTS, *TRANSPORT PLANES, *RADAR NAVIGATION, AUTOMATIC, RELIABILITY, FLIGHT TESTING,) (RADAR SIGNALS, DATA PROCESSING SYSTEMS, DATA TRANSMISSION SYSTEMS, *RADIO NAVIGATION, TESTS,) (*ALL-WEATHER AVIATION, LANDING, INSTRUMENT LANDING, RADAR EQUIPMENT, RADIO EQUIPMENT,)
BELL AEROSYSTEMS CO., BUFFALO, N. Y.
AD-273 538 62-2-6 DIV. 19

***RADIO RANGES**

(*WAVE TRANSMISSION OF *VERY LOW FREQUENCY, ENERGY BETWEEN EARTH AND *IONOSPHERE, *ATMOSPHERICS,) (*RADIO RANGES AND *AZIMUTH OF RADIOFREQUENCY OSCILLATORS, RADIOFREQUENCY SPECTRUM ANALYZERS,) (*WAVEGUIDES, ANTENNAS, RADIO RECEIVERS, OSCILLOSCOPES, DELAY LINES, RADIOFREQUENCY AMPLIFIERS,) (ERRORS, MATHEMATICAL PREDICTION,)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 784 62-2-6 DIV. 25

***RADIO RELAY STATIONS**

(*AIR FORCE COMMUNICATIONS, *RADIO RELAY STATIONS, *RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, *RADIO COMMUNICATION SYSTEMS, *DATA TRANSMISSION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS, *VOICE COMMUNICATION SYSTEMS, RADIO RECEIVERS, TELETYPE SYSTEMS,) (COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, ANALOG TO DIGITAL CONVERTERS, DATA STORAGE SYSTEMS, DATA PROCESSING SYSTEMS,) RADIO SIGNALS, REFLECTIONS,
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

***RADIO RELAY SYSTEMS**

(*AIR FORCE COMMUNICATIONS, *RADIO RELAY STATIONS, *RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, *RADIO COMMUNICATION SYSTEMS, *DATA TRANSMISSION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS, *VOICE COMMUNICATION SYSTEMS, RADIO RECEIVERS, TELETYPE SYSTEMS,) (COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, ANALOG TO DIGITAL CONVERTERS, DATA STORAGE SYSTEMS, DATA PROCESSING SYSTEMS,) RADIO SIGNALS, REFLECTIONS,
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

***RADIO SIGNALS**

(ANALYSIS OF *ELECTRON BEAMS, *CAMERA TUBES OF *RADIO SIGNALS, CYLINDRICAL BODIES, DESIGN,) (*RADIOFREQUENCY POWER, MICROWAVE EQUIPMENT, CAVITY RESONATORS, RESONANCE, ELECTROMAGNETIC WAVES, OSCILLATION,) (MOTION OF ELECTRONS, BESSEL FUNCTIONS, TAYLOR'S SERIES, DIFFERENTIAL EQUATIONS,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 781 62-2-6 DIV. 8

***RADIO TRANSMISSION**

(*RADIO WAVES, HIGH FREQUENCY, VERY HIGH FREQUENCY, *RADIO TRANSMISSION, ABSORPTION, ATTENUATION, PROPAGATION, IONOSPHERIC PROPAGATION,) (*AURORAE, IONOSPHERE, ARCTIC REGIONS, RADIO COMMUNICATION SYSTEMS, RELIABILITY, ERRORS,)
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 778 62-2-6 DIV. 5

***RADIO TRANSMITTERS**

(*LUNAR PROBES, MOBILE, COMMUNICATION EQUIPMENT,) (*RADIO COMMUNICATION SYSTEMS, *TELEVISION COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PULSE MODULATION, CODING, MATHEMATICAL ANALYSIS,) (RADIOFREQUENCY POWER OF *RADIO TRANSMITTERS, ANTENNAS FOR RADIO RECEIVERS,) (MOON TO EARTH, COMMUNICATION SYSTEMS,)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 812 62-2-6 DIV. 12

***RADIO WAVES**

(*RADIO WAVES, REFLECTION, DIFFRACTION, PROPAGATION, IONOSPHERE, PHASE MEASUREMENT, IONOSPHERIC PROPAGATION, DENSITY, ANALYSIS,) (*COUPLED ANTENNAS, LINEAR SYSTEMS, PHASE DETECTORS USING SEMICONDUCTORS, SWITCHING CIRCUITS, SWITCHES, PREAMPLIFIERS, INSTRUMENTATION,) DIGITAL RECORDING SYSTEMS, DIGITAL COMPUTERS,
IONOSPHERE RESEARCH LAB., PENNSYLVANIA STATE UNIVERSITY PARK.
AD-273 721 2-2-6 DIV. 8

(*RADIO WAVES, HIGH FREQUENCY, VERY HIGH FREQUENCY, *RADIO TRANSMISSION, ABSORPTION, ATTENUATION, PROPAGATION, IONOSPHERIC PROPAGATION,) (*AURORAE, IONOSPHERE, ARCTIC REGIONS, RADIO COMMUNICATION SYSTEMS, RELIABILITY, ERRORS,)
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 778 62-2-6 DIV. 5

***RADIOACTIVATION ANALYSIS**

(*VULCANIZATES, ADDITIVES, *ELASTOMERS, *RADIOACTIVATION ANALYSIS, *RUBBER, *RADIATION EFFECTS, GAMMA EMISSION,)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 636 2-2-6 DIV. 20

***RADIOACTIVE FALL-OUT**

(METEOROLOGY, *METEOROLOGICAL RADAR, RADAR SIGNALS FOR *RADIOACTIVE FALL-OUT FROM *NUCLEAR EXPLOSIONS,) (*INSTRUMENTATION, METEOROLOGICAL DATA, STORMS, PRECIPITATION,) (DIGITAL COMPUTERS, DATA PROCESSING SYSTEMS, MAGNETIC TAPE,) RESEARCH PROGRAM ADMINISTRATION,
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 451 62-2-6 DIV. 2

***RADIOACTIVE FILMS**

(*THERMAL NEUTRONS, *FAST NEUTRONS, *DOSIMETERS, RADIOACTIVE FILMS, PHOTOGRAPHIC EMULSIONS, DETECTORS,) (*WATER BOILER REACTORS, GAMMA RAYS, GAMMA EMISSION, SENSITIVITY, PHOTONS,) (CADMIUM, LITHIUM, GOLD, FUELS,) EXPERIMENTAL DATA,
NUCLEAR DEFENSE LAB., ARMY CHEMICAL CENTER, MD.
AD-273 436 62-2-6 DIV. 20

***RADIOFREQUENCY**

(THEORY OF RHOMBIC, *ANTENNAS FOR DETERMINATION OF THE *ELECTROMAGNETIC *WAVES, *RADIOFREQUENCY, SENSITIVITY, HAZARDS AND SAFETY, DISTANCES FOR *ELECTRIC DETONATORS,) RADAR EQUIPMENT, ELECTROMAGNETIC FIELDS, HAZARDS,
AMMUNITION GROUP, PICATINNY ARSENAL, DOVER, N. J.
AD-273 648 62-2-6 DIV. 22

***RADIOFREQUENCY AMPLIFIERS**

(*RADIO COMMUNICATION SYSTEMS, SIDEBANDS, *POWER AMPLIFIERS, ELECTRON TUBES, AIRBORNE, DESIGN, LINEAR SYSTEMS, MODEL TESTS, MATHEMATICAL ANALYSIS,) (*NAVAL COMMUNICATIONS, *RADIOFREQUENCY AMPLIFIERS, SIDEBANDS, LINEAR SYSTEMS, ELECTRICAL NETWORKS, TESTS,)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 642 62-2-6 DIV. 5

***RADIOFREQUENCY COILS**

(*RADIOFREQUENCY COILS, *MINIATURE ELECTRONIC EQUIPMENT, FERROMAGNETIC MATERIALS, FERRITES, THIN FILMS, METAL FILMS, NICKEL ALLOYS, IRON ALLOYS, CHLORIDES, OXIDES, ZINC ALLOYS, COBALT ALLOYS, ELECTROPLATING, PROCESSING, *MANUFACTURING METHODS, PRODUCTION, DESIGN,) (COILS, INDUCTANCE, MEASUREMENT,)
MOTOROLA, INC., PHOENIX, ARIZ.
AD-273 838 62-2-6 DIV. 8

***RADIOFREQUENCY FILTERS**

(*ELECTRIC DETONATORS, *ELECTRIC IGNITERS, ELECTROMAGNETIC WAVES, HAZARDS,) (*ELECTRONIC CIRCUITS, *RADIOFREQUENCY FILTERS, LOW-PASS FILTERS, RADIOFREQUENCY ATTENUATORS, RADIOFREQUENCY TRANSFORMERS, RADIOFREQUENCY COILS, DESIGN, SAFETY DEVICES, EFFECTIVENESS,) TRANSISTORS, ELECTRONIC SWITCHES, DIODES,
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
AD-273 548 62-2-6 DIV. 22

***RADIOFREQUENCY POWER**

(ANALYSIS OF *ELECTRON BEAMS, *CAMERA TUBES OF *RADIO SIGNALS, CYLINDRICAL BODIES, DESIGN,) (*RADIOFREQUENCY POWER, MICROWAVE EQUIPMENT, CAVITY RESONATORS, RESONANCE, ELECTROMAGNETIC WAVES, OSCILLATION,) (MOTION OF ELECTRONS, BESSEL FUNCTIONS, TAYLOR'S SERIES, DIFFERENTIAL EQUATIONS,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 781 62-2-6 DIV. 8

(*ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION,) (*KLYSTRONS, CAVITY RESONATORS, HARMONIC ANALYSIS, *RADIOFREQUENCY POWER, MEASUREMENTS,)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 808 62-2-6 DIV. 8

(*PLASMA PHYSICS, MEASUREMENT BY *CAVITY RESONATORS, MICROWAVE EQUIPMENT, *RADIOFREQUENCY POWER, *MICROWAVE PROBES,) (FERRITES, MAGNETRONS, KLYSTRONS, OSCILLOGRAMS, FREQUENCY MODULATION, QUARTZ RESONATORS, WAVEGUIDES,) (ANALYSIS, PERTURBATION THEORY, ELECTRONS, DENSITY,)
RESEARCH LAB. OF ELECTRONICS, MASS. INST. OF TECH., CAMBRIDGE.
AD-273 830 62-2-6 DIV. 25

***RADOMES**

(*RADOMES, CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, MANUFACTURING METHODS, PROCESSING, MOLDING, CASTING, HEAT TREATMENT, INDUSTRIAL EQUIPMENT, HYDRAULIC PRESSES,) (PHYSICAL PROPERTIES, ELECTRICAL PROPERTIES,)
SHERANGO CHINA, INC., NEW CASTLE, PA.
AD-273 584 62-2-6 DIV. 6

(*CERAMIC MATERIALS, *SILICON COMPOUNDS, DIOXIDES, PROCESSING OF *RADOMES BY PRESSURE CASTING AND IMPREGNATION WITH ALUMINUM COMPOUNDS, CHLORIDES, POROSITY, MECHANICAL PROPERTIES,) (*GUIDED MISSILE NOSES, MANUFACTURING METHODS,)
GEORGIA INST. OF TECH. ENGINEERING EXPERIMENT STATION, ATLANTA.
AD-273 895 62-2-6 DIV. 19

***RANGE FINDING**

(AZIMUTH AND *RANGE FINDING OF ENEMY, COMBAT, ARTILLERY UNITS, WEAPONS AND *GLASS USING *SOUND RANGING AND *INFRARED DETECTORS.) (POSITION FINDING OF GUNS BY GUN FLASH AND FIRING NOISE, THEORY, FEASIBILITY STUDIES.) INFRARED OPTICAL SYSTEMS, *MICROPHONES.
FRANKFORD ARSENAL, PHILADELPHIA, PA.
AD-328 629 62-2-6 DIV.

***REACTION KINETICS**

(*REACTION KINETICS, CHEMICAL REACTIONS, COMBUSTION, MIXTURES, *HYDROCARBONS, *OXYGEN, *NITROGEN, *FLAMES.) (ENERGY, CHEMICAL BONDS, *FLAME PROPAGATION, TEMPERATURE.) (BUTANES, PENTANES.) ETHYLENE OXIDE, FUELS.
LOUVAIN U., (BELGIUM).
AD-273 629 62-2-6 DIV. 10

(*IONIZATION, *REACTION KINETICS, *DISSOCIATION, *RECOMBINATION REACTIONS.) (GAS IONIZATION, RARE GASES, MOLECULAR ASSOCIATION.) (MEASUREMENT OF IONIZATION BASED ON ELECTROSTATICS, MICROWAVES, MASS SPECTROMETERS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 673 62-2-6 DIV. 20

***RECOMBINATION REACTIONS**

(*IONIZATION OF CHEMICALS IN *IONOSPHERE, CESIUM, VAPORS.) (SIMULATION OF *RECOMBINATION REACTIONS.) (LABORATORIES, INSTRUMENTATION, MASS SPECTROMETERS, IONIZATION CHAMBERS, MICROWAVES.)
BIRMINGHAM U., (ENGLAND).
AD-273 613 62-2-6 DIV. 25

(*IONIZATION, *REACTION KINETICS, *DISSOCIATION, *RECOMBINATION REACTIONS.) (GAS IONIZATION, RARE GASES, MOLECULAR ASSOCIATION.) (MEASUREMENT OF IONIZATION BASED ON ELECTROSTATICS, MICROWAVES, MASS SPECTROMETERS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 673 62-2-6 DIV. 20

(HIGH ALTITUDE, *ATOMIC BOMB EXPLOSIONS.) (FISSION PRODUCTS, IONIZATION, *RECOMBINATION REACTIONS.) (PLASMA PHYSICS, RECOMBINATION REACTIONS.) HYDROGEN.
GEOPHYSICS CORP. OF AMERICA, BOSTON, MASS.
AD-273 694 2-2-6 DIV. 20

***RE-ENTRY AERODYNAMICS**

(MEASUREMENT, *ELECTRICAL CONDUCTANCE OF AIR, IONIZATION DURING *RE-ENTRY AERODYNAMICS.) (*INSTRUMENTATION, DESIGN OF SHOCK WAVES, *CONDUCTIVITY, *METERS FOR SATELLITE VEHICLES.) (CALIBRATION AND FLIGHT TESTING UNDER *SPACE ENVIRONMENTAL CONDITIONS.) (*MAGNETOHYDRODYNAMICS, EXPERIMENTAL DATA, RELIABILITY.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 678 62-2-6 DIV. 9

(*RE-ENTRY VEHICLES, *BLUNT BODIES, AERODYNAMIC HEATING, *RE-ENTRY AERODYNAMICS, AERODYNAMICS, HYPERSONICS, GAS IONIZATION, SHOCK WAVES, THERMAL RADIATION, *INFRARED RADIATION, MATHEMATICAL ANALYSIS, MEASUREMENT.) (NITROGEN, AIR, HEATING, INFRARED RADIATION.)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 865 62-2-6 DIV. 9

(USSR, TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH.) (*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, LIFE EXPECTANCY, SPACE FLIGHT TO *MOON, MARS, VENUS, SUN.) (SPACESHIPS, DECELERATION, *RE-ENTRY AERODYNAMICS.) (*UPPER ATMOSPHERE, GEOPHYSICS, *IONOSPHERE.) (PHOTOGRAPHY OF MOON, VAN ALLEN RADIATION BELT.) (BIOLOGY, CONTROLLED ATMOSPHERES, *CLOSED-CYCLE ECOLOGICAL SYSTEMS, DOGS, MANNED PILOTS, TRAINING, AVIATION SAFETY, GLOBAL FLIGHT.)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***RE-ENTRY VEHICLES**

(*RE-ENTRY VEHICLES, *BLUNT BODIES, AERODYNAMIC HEATING, *RE-ENTRY AERODYNAMICS, HYPERSONICS, GAS IONIZATION, SHOCK WAVES, THERMAL RADIATION, *INFRARED RADIATION, MATHEMATICAL ANALYSIS, MEASUREMENT.) (NITROGEN, AIR, HEATING, INFRARED RADIATION.)
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
AD-273 865 62-2-6 DIV. 9

***REFLECTOMETERS**

(*MICROWAVE PROBES, *PLASMA PHYSICS, *ANTENNAS, *WAVEGUIDE WINDOWS.) (*REFLECTOMETERS, OSCILLOGRAMS, WAVEGUIDES, ATTENUATION.) (INSTRUMENTATION, DESIGN UNDER FLIGHT TESTING.) (BOUNDARY LAYER, SHOCK WAVES, PROPAGATION, WAVE TRANSMISSION.)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 740 62-2-6 DIV. 25

***REFLECTORS**

(OPTICS, *MIRRORS, *REFLECTORS, MANUFACTURING METHODS, ELECTROFORMING, SURFACES, COATINGS, METAL COATINGS, RHODIUM, THIN FILMS, FILMS, FEASIBILITY STUDIES.) (ELECTROPLATING, PLATING, NICKEL PLATING.)
OPTICAL MATERIALS, ELECTRO-OPTICAL SYSTEMS, INC., PASADENA, CALIF.
AD-273 690 62-2-6 DIV. 30

***REFRACTORY MATERIALS**

(*MATERIALS FOR SPACESHIPS AND SATELLITE VEHICLES, *REFRACTORY MATERIALS, *ALLOYS, *COATINGS, METALLIC TEXTILES, SOLID ROCKET PROPELLANTS, *METALS, FOAMS, BERYLLIUM COMPOUNDS, OXIDES, OPTICS, ABLATION, *PLASTICS, *ELASTOMERS, ADHESIVES, FILAMENT WOUND CONSTRUCTION, CRYOGENICS, SHIELDING.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 676 62-2-6 DIV. 14

***REFRIGERANT CONDENSERS**

(*CRYOGENICS, FEASIBILITY STUDIES, *INFRARED RADIATION, *SOLAR ENERGY, *REFRIGERANT CONDENSERS, SHIELDING, VACUUM SYSTEMS, NITROGEN.) (INSTRUMENTATION, MEASUREMENT, VACUUM PUMPS, DESIGN, IONIZATION, GAGES.) (HEAT TRANSFER, THERMAL DIFFUSION, ALUMINUM.)
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
AD-273 739 2-2-6 DIV. 25

***RESEARCH REACTORS**

(*DIGITAL COMPUTERS, *PROGRAMMING OF *SHIELDING, PENETRATION OF *GAMMA RAY, *NEUTRON SPECTRUM FROM LEAKAGE OF *RESEARCH REACTORS.)
GENERAL DYNAMICS/FORT WORTH, TEX.
AD-273 698 62-2-6 DIV. 30

***RHENIUM**

(*RHENIUM, NUCLEAR REACTIONS, BIOCHEMISTRY, GAMMA-NEUTRON REACTIONS, *NEUTRON CROSS SECTIONS, NUCLEAR PHYSICS.)
FLORIDA U., GAINESVILLE.

AD-273 541 62-2-6 DIV. 20

***ROADS**

(TERRAIN, *ROADS, *VEHICLES, MOTION, SIMULATION ON *DIGITAL COMPUTERS.) *VEHICLE WHEELS, *PROGRAMMING, COMPUTERS, ORDNANCE TANK-AUTOMOTIVE COMMAND, DETROIT, MICH.
AD-273 687 62-2-6 DIV. 11

***ROCKET CASES**

(*ROCKET CASES, MATERIALS, *SHEETS, *TITANIUM ALLOYS-BASE, ALUMINUM ALLOYS, CHROMIUM ALLOYS, VANADIUM ALLOYS, *WELDS, *FRACTURE (MECHANICS), HEAT TREATMENT, CRYSTAL STRUCTURE, MICROSTRUCTURE, AGING, HARDNESS, DATA.)
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 711 2-2-6 DIV. 17

(ROCKET MOTORS, SOLID ROCKET PROPELLANTS, *ROCKET CASES, *COUPLINGS, RINGS, PREPARATION, PROCESSING, PRODUCTION, DRAWING (MACHINE PROCESSING), FORGING, EXPLOSIVE FORMING, WELDING, MACHINING, EFFECTIVENESS OF *INDUSTRIAL PRODUCTION, RESEARCH PROGRAM ADMINISTRATION.)
6593D TEST GROUP (DEV) AIR FORCE SYSTEMS COMMAND EDWARDS AIR FORCE BASE, CALIF.
AD-273 796 62-2-6 DIV. 27

(SOLID ROCKET PROPELLANTS, *ROCKET MOTORS, *ROCKET CASES, MANUFACTURING METHODS, DRAWING (MACHINE PROCESSING), HEAT TREATMENT, MACHINE TOOLS, DIES.) (METALS, ALLOYS, *STEEL, *TITANIUM ALLOYS, NICKEL ALLOYS, PROCESING, HARDENING, MICROSTRUCTURE.)
LYCN INC., DETROIT, MICH.
AD-273 826 62-2-6 DIV. 27

***ROCKET LABORATORIES**

(COMBUSTION CHAMBERS, COMBUSTION CHAMBER GASES, *WATER, *STEAM.) (ROCKET MOTORS, EXHAUST GASES, JET MIXING FLOW, STEAM.) (*ROCKET LABORATORIES, INSTRUMENTATION, SPECIFIC IMPULSE.) *GAS GENERATING SYSTEMS, ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AIR FORCE STATION, TENN.
AD-273 688 62-2-6 DIV. 25

***ROCKET MOTORS**

(SOLID ROCKET PROPELLANTS, *ROCKET MOTORS, *ROCKET CASES, MANUFACTURING METHODS, DRAWING (MACHINE PROCESSING), HEAT TREATMENT, MACHINE TOOLS, DIES.) (METALS, ALLOYS, *STEEL, *TITANIUM ALLOYS, NICKEL ALLOYS, PROCESING, HARDENING, MICROSTRUCTURE.)
LYCN INC., DETROIT, MICH.
AD-273 826 62-2-6 DIV. 27

(*SOLID ROCKET PROPELLANTS, BONDING TO ROCKET CASES OF *ROCKET MOTORS.) (PROPELLANT GRAINS, ELASTICITY, PLASTICITY, VISCOSITY, STRESSES, THERMAL STRESSES, THERMODYNAMICS, TEMPERATURE, FAILURE (MECHANICS), TESTS, TEST METHODS.)
LOCKHEED PROPULSION CO., REDLANDS, CALIF.
AD-273 871 62-2-6 DIV. 27

(*ROCKET MOTORS, PRESSURE, HEAT TRANSFER, COOLING, FUEL SYSTEMS, COMBUSTION CHAMBERS, DESIGN, THRUST, COMBUSTION, GAS FLOW, COMBUSTION CHAMBER GASES, THEORY, MATHEMATICAL ANALYSIS, RELIABILITY.) (ROCKET MOTOR NOZZLES, DESIGN.) (EXHAUST GASES, GAS FLOW.) (*LIQUID ROCKET PROPELLANTS, ROCKET FUELS, ROCKET OXIDIZERS, THERMODYNAMICS, PROPELLANT PROPERTIES.) (GAS TURBINES, GAS GENERATING SYSTEMS.) (FUEL INJECTORS, FUEL NOZZLES, FUEL SPRAYS.) INSTRUCTION MANUALS.
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 887 62-2-6 DIV. 27

***ROCKET OXIDIZERS**

(*LIQUID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, ROCKET MOTORS, *SPECIFIC IMPULSE, MATHEMATICAL ANALYSIS,) (LIQUEFIED GASES, OXYGEN, NITROGEN COMPOUNDS, TETROXIDES, HYDRAZINES, METHYL HYDRAZINES, AMMONIA, CHLORIDES, PERCHLORYL RADICALS, FLUORINE, FLUORIDES, PENTABORANES, HYDROGEN, HYDROGEN COMPOUNDS, PEROXIDES, PERCHLORATES.) *HANDBOOKS, TABLES.
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 675 62-2-6 DIV. 10

(*LIQUID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, ELECTROCHEMISTRY, SYNTHESIS.) (*NITROGEN COMPOUNDS, *OXYFLUORIDES PROD ELECTROLYSIS OF FLUORIDES, HYDROGEN COMPOUNDS, NITROGEN COMPOUNDS, TETROXIDES, NITRIC ACID.) (ELECTRODES, PLATINUM, NICKEL, ELECTROLYTIC CELLS, ELECTRIC POTENTIAL, ELECTRICAL CONDUCTANCE.)
ROCKETDYNE, CANOGA PARK, CALIF.
AD-273 888 62-2-6 DIV. 4

***ROCKET PLANES**

(*ROCKET PLANES, RESEARCH PLANES, HYPERVELOCITY VEHICLES, STABILIZATION SYSTEMS, DAMPING.) (*STABILIZATION SYSTEMS, SERVO SYSTEMS, DESIGN, FLIGHT TESTING, RELIABILITY, VIBRATION, HAZARDS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 565 62-2-6 DIV. 1

(RESEARCH PLANES, *ROCKET PLANES, DESIGN, FLIGHT TESTING.) (*AIRFRAMES, AIRPLANE PANELS, FAILURE (MECHANICS) FROM AIRPLANE NOISE, ROCKET MOTOR NOISE, FLUTTER, VIBRATION, STRUCTURES, DYNAMICS.) (LAUNCHING FROM JET BOMBERS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 566 62-2-6 DIV. 1

(*ROCKET PLANES, RESEARCH PLANES, HYPERVELOCITY VEHICLES, PARASITE PLANES, SIMULATION OF CONTROL AND STABILITY, TEST METHODS, FLIGHT TESTING, PROGRAMMING OF FLIGHT PATHS, HUMAN ENGINEERING OF CONTROL, GROUND SUPPORT EQUIPMENT.) (PILOTS, TRAINING WITH FLIGHT SIMULATORS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 567 62-2-6 DIV. 1

***RODS**

(WAVE TRANSMISSION, *STRESSES, *BLAST (LOADING), *DEFORMATION, ELASTICITY, PLASTICITY, MECHANICS.) (DISLOCATIONS OF *CRYSTAL STRUCTURE, LATTICES IN SOLIDS, *RODS, *STRUCTURAL SHELLS, ELASTIC SHELLS.) (POTENTIAL THEORY, PARTIAL DIFFERENTIAL EQUATIONS, HARMONIC ANALYSIS, FOURIER ANALYSIS.) CONTINUUM MECHANICS, LOAD DISTRIBUTION.
AMERICAN MACHINE AND FOUNDRY CO., NILES, ILL.
AD-273 536 62-2-6 DIV. 25

***ROTATING STRUCTURES**

(*VIBRATIONS, RESONANCE, DEFORMATION OF *ROTATING STRUCTURES.) (EQUATION OF MOTION, DIFFERENTIAL EQUATIONS.) STATICS.
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 593 62-2-6 DIV. 25

***RUBBER**

(*VULCANIZATES, ADDITIVES, *ELASTOMERS, *RADIOACTIVATION ANALYSIS, *RUBBER, *RADIATION EFFECTS, GAMMA EMISSION.)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 636 2-2-6 DIV. 20

***RUBIDIUM**

(ALKALI METALS, *RUBIDIUM, *CESIUM, VAPORS, THEORY, THERMODYNAMICS, TRANSPORT PROPERTIES, MATHEMATICAL ANALYSIS,

RECOMBINATION REACTIONS.) (ENERGY, ENTHALPY, SPECIFIC HEAT.) GASES.
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 594 62-2-6 DIV. 4

***SANDWICH PANELS**

(*SANDWICH PANELS, MANUFACTURING METHODS, DESIGN, *BRAZING, HONEYCOMB CORES, REFRACTORY MATERIALS, METALS, *MOLYBDENUM ALLOYS, *NIOBIUM ALLOYS, TITANIUM ALLOYS, ZIRCONIUM ALLOYS.) (REFRACTORY COATINGS, SANDWICH CONSTRUCTION, OXIDATION INHIBITORS, HEAT SHIELDING, SPACESHIPS, SATELLITE VEHICLES, THERMAL INSULATION.) (HIGH TEMPERATURE RESEARCH, SOLDERING ALLOYS, VACUUM FURNACES, TESTS, TEST EQUIPMENT, TOOLS.) (HONEYCOMB CORES, ELECTRON BEAMS, WELDING.) (SHEETS, FOILS, PROCESSING, MECHANICAL PROPERTIES.)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 650 62-2-6 DIV. 26

***SATELLITE VEHICLE RESEARCH**

(USSR, TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH.) (*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, LIFE EXPECTANCY, SPACE FLIGHT TO *MOON, MARS, VENUS, SUN.) (SPACESHIPS, DECELERATION, *RE-ENTRY AERODYNAMICS.) (*UPPER ATMOSPHERE, GEOPHYSICS, *IONOSPHERE.) (PHOTOGRAPHY OF MOON, VAN ALLEN RADIATION BELT.) (BIOLOGY, CONTROLLED ATMOSPHERES, *CLOSED-CYCLE ECOLOGICAL SYSTEMS, DOGS, MANNED, PILOTS, TRAINING, AVIATION SAFETY, GLOBAL FLIGHT.)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***SATELLITE VEHICLE TRAJECTORIES**

(*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS OF USSR, SATELLITE VEHICLES, CELESTIAL MECHANICS, OPTICAL TRACKING, OPTICAL EQUIPMENT, MATHEMATICAL ANALYSIS, TABLES, DATA.) (TRANSLATIONS, USSR.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 483 62-2-6 DIV. 12

(MATHEMATICAL ANALYSIS OF *SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, POSITION FINDING, MATHEMATICAL PRECISION WITH TIME, EQUATIONS, THEORY.)
AIR FORCE PROVING GROUND COMMAND, EGLIN AIR FORCE BASE, FLA.
AD-273 597 62-2-6 DIV. 2

(USSR, TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH.) (*SATELLITE VEHICLE TRAJECTORIES, ORBITAL FLIGHT PATHS, LIFE EXPECTANCY, SPACE FLIGHT TO *MOON, MARS, VENUS, SUN.) (SPACESHIPS, DECELERATION, *RE-ENTRY AERODYNAMICS.) (*UPPER ATMOSPHERE, GEOPHYSICS, *IONOSPHERE.) (PHOTOGRAPHY OF MOON, VAN ALLEN RADIATION BELT.) (BIOLOGY, CONTROLLED ATMOSPHERES, *CLOSED-CYCLE ECOLOGICAL SYSTEMS, DOGS, MANNED, PILOTS, TRAINING, AVIATION SAFETY, GLOBAL FLIGHT.)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***SATELLITE VEHICLES**

(*RADIO ASTRONOMY, *INTERFEROMETERS, *OPTICAL TRACKING OF *SATELLITE VEHICLES, SPACE FLIGHT.) (CALIBRATION, OPTICAL EQUIPMENT, RADIO SIGNALS, SIGNAL-TO-NOISE RATIO.) (ORBITAL FLIGHT PATHS OF GALAXIES, *STARS.) CELESTIAL MECHANICS.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 498 62-2-6 DIV. 2

(*SATELLITE VEHICLES, *GLIDEC MISSILES, SURFACE TO SURFACE, RADAR TRACKING, RADIO INTERFEROMETERS, *TRACKING.) (*PLASMA PHYSICS, *ELECTROMAGNETIC FIELDS, *WAVE TRANSMISSION, ELECTROMAGNETIC WAVES, MAGNETOHYDRODYNAMICS, *IONOSPHERIC DISTURBANCES, IONS, IONOSPHERE, UPPER ATMOSPHERE, *RADIO ASTRONOMY, RADIO WAVES, EXTRATERRESTRIAL RADIO WAVES, ANTENNA RADIATION PATTERNS, USSR.
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 537 62-2-6 DIV. 12

(*SATELLITE VEHICLES, *NAVIGATION.) (SPACE ENVIRONMENTAL CONDITIONS, *THERMAL INSULATION, *TEMPERATURE CONTROL, HEAT TRANSFER, THERMAL CONDUCTIVITY, RADIATORS, COATINGS, HEAT RESISTANT PAINTS.) (SURFACES, TEMPERATURE.)
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
AD-273 555 2-2-6 DIV. 12

(*SATELLITE VEHICLES, *SPACE PROBES, ROCKET MOTORS, BOOSTER ROCKETS, ERRORS IN FLIGHT PATHS DUE TO STAGING, SEPARATION.) (SIMULATION OF *STAGING, TEST FACILITIES, DESIGN, DYNAMICS, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS.) (EXPERIMENTAL DATA, MATHEMATICAL ANALYSIS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 564 62-2-6 DIV. 12

(*SATELLITE VEHICLES, COMMUNICATION SYSTEMS, BALLOONS, CALIBRATION, TESTS OF RADIO INTERFEROMETERS, TRACKING AND OPTICAL TRACKING WITH *BALLISTIC CAMERAS, MATHEMATICAL ANALYSIS OF ERRORS, SATELLITE VEHICLE TRAJECTORIES.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 630 62-2-6 DIV. 12

(DENSITY OF AIR IN *SATELLITE VEHICLES, ORBITAL FLIGHT PATHS, *DECELERATION, EQUATIONS.) (*HYDROSTATIC PRESSURE, GAS FLOW, PERTURBATION THEORY.) (FUNCTIONS, POLYNOMIALS, INTEGRAL EQUATIONS.)
AIR FORCE PROVING GROUND COMMAND, EGLIN AIR FORCE BASE, FLA.
AD-273 680 62-2-6 DIV. 12

(*SATELLITE VEHICLES FOR COMMUNICATION SYSTEMS, ORBITAL FLIGHT PATHS, STABILIZATION, PERTURBATION THEORY, CELESTIAL MECHANICS.)
RAND CORP., SANTA MONICA, CALIF.
AD-273 726 2-2-6 DIV. 12

(*AIR FORCE COMMUNICATIONS, *RADIO RELAY STATIONS, *RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, *RADIO COMMUNICATION SYSTEMS, *DATA TRANSMISSION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS, *VOICE COMMUNICATION SYSTEMS, RADIO RECEIVERS, TELETYPE SYSTEMS.) (COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, ANALOG TO DIGITAL CONVERTERS, DATA STORAGE SYSTEMS, DATA PROCESSING SYSTEMS.) RADIO SIGNALS, REFLECTIONS.
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

***SCATTERING**

(*SOLAR SPECTRUM, *SCATTERING OF *INFRARED RADIATION IN ATMOSPHERE.) (ASTRONOMICAL OBSERVATORIES, TELESCOPES, MONOCHROMATIC LIGHT.) (AIR MASS ANALYSIS, PRECIPITATION, *WATER.) ASTRONOMICAL DATA, ARIZONA, ARIZONA STATE COLL., FLAGSTAFF.
AD-273 599 62-2-6 DIV. 2

(*EXTRATERRESTRIAL RADIO WAVES, *ABSORPTION, IONOSPHERE, AURORAE, ARCTIC REGIONS.) (RADIO COMMUNICATION SYSTEMS, *SCATTERING, IONOSPHERE, ARCTIC REGIONS.)
PAGE COMMUNICATIONS ENGINEERS, INC., WASHINGTON, D. C.
AD-273 725 2-2-6 DIV. 2

***SCHEDULING**

(OPERATIONS RESEARCH, *SCHEDULING, *TRAFFIC.) STATISTICAL ANALYSIS.
APPLIED MATHEMATICS AND STATISTICS LABS., STANFORD U., CALIF.
AD-273 653 62-2-6 DIV. 26

***SCIENTIFIC PERSONNEL**

(*BIBLIOGRAPHY OF *SCIENTIFIC PERSONNEL ACTIVE IN USSR, MASER, *SCIENTIFIC RESEARCH.) QUANTUM MECHANICS, RADIO WAVES, PHYSICS.) SEMICONDUCTORS, ORGANIC MATERIALS.
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 894 62-2-6 DIV. 25

***SCIENTIFIC RESEARCH**

(*BIBLIOGRAPHY OF *SCIENTIFIC PERSONNEL ACTIVE IN USSR, MASER, *SCIENTIFIC RESEARCH.) QUANTUM MECHANICS, RADIO WAVES, PHYSICS.) SEMICONDUCTORS, ORGANIC MATERIALS.
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 894 62-2-6 DIV. 25

***SEA WATER**

(*SEA WATER, *DENSITY IN THE *OCEANS AS A METHOD OF DEPTH FINDING FOR *PRESSURE VESSELS, DESIGN.)
NAVAL ORDNANCE LAB., WHITE OAK, MD.
AD-273 634 62-2-6 DIV. 2

***SEALING COMPOUNDS**

(MATERIALS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, PHYSICAL PROPERTIES, TEST METHODS.) (*ADHESIVES, RESIN ADHESIVES, RUBBER ADHESIVES, *LAMINATES, RESINS, PLASTICS, GLASS TEXTILES, *SEALS, *SEALING COMPOUNDS.) (*ALLOYS, *STEEL (4130, 15-7PH, 4340, 300F), *STAINLESS STEEL (AM 350, A286, AM 355, 321, 422, PH 15-7 MO, 17-4 PH), *ALUMINUM ALLOYS (7075-T73, X2219-T61, VANADIUM ALLOYS.) (HONEYCOMB CORES, SANDWICH CONSTRUCTION, BRAZING, SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X, RENE' 41, M-252, INCONEL 718), CHROMIUM ALLOYS, COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***SEALS**

(MATERIALS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, PHYSICAL PROPERTIES, TEST METHODS.) (*ADHESIVES, RESIN ADHESIVES, RUBBER ADHESIVES, *LAMINATES, RESINS, PLASTICS, GLASS TEXTILES, *SEALS, *SEALING COMPOUNDS.) (*ALLOYS, *STEEL (4130, 15-7PH, 4340, 300F), *STAINLESS STEEL (AM 350, A286, AM 355, 321, 422, PH 15-7 MO, 17-4 PH), *ALUMINUM ALLOYS (7075-T73, X2219-T61, VANADIUM ALLOYS.) (HONEYCOMB CORES, SANDWICH CONSTRUCTION, BRAZING, SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X, RENE' 41, M-252, INCONEL 718), CHROMIUM ALLOYS, COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***SEMICONDUCTORS**

(*SEMICONDUCTORS, *DIODES, *REGULATORS, DETECTORS, CIRCUITS, DESIGN, TRANSISTORS, *ELECTRONIC CIRCUITS, HIGH FREQUENCY, VERY HIGH FREQUENCY, THEORY, OPERATION, MEASUREMENT, MATHEMATICAL ANALYSIS, *BIBLIOGRAPHY.)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON, MASS.
AD-273 510 62-2-6 DIV. 8

(*SEMICONDUCTORS, INTERMETALLIC COMPOUNDS, *SINGLE CRYSTALS, *CADMIUM COMPOUNDS, *TELLURIDES, PHASE STUDIES, MELTING, GROWTH, ZONE MELTING, TEMPERATURE, ELECTRON OPTICS, REFLECTION, ABSORPTION, SPECTROGRAPHIC ANALYSIS, SOLID STATE PHYSICS.)
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
AD-273 623 62-2-6 DIV. 25

(*ORGANIC MATERIALS, *SEMICONDUCTORS, *ORGANIC COMPOUNDS, POLYMERS, CONDUCTIVITY, ELECTRICAL PROPERTIES, THEORY, SOLID STATE PHYSICS,) BENZENES, *BIBLIOGRAPHY.
PLASTICS LAB., PRINCETON U., N. J.
AD-273 720 62-2-6 DIV. 14

(*SEMICONDUCTORS, *ORGANIC MATERIALS, *ORGANIC COMPOUNDS, *POLYMERS, SYNTHESIS, MOLECULAR STRUCTURE, CONDUCTIVITY, RESISTANCE, HALL EFFECT, THERMOELECTRICITY, THOTOCONDUCTIVITY, ELECTRONS, SPIN, STABILITY,) QUINONES, ANTHRACENES, NAPHTHALENES, PHENANTHRENES, BENZENES, FERROCENES, ANILINE.)
PLASTICS LAB., PRINCETON U., N. J.
AD-273 723 2-2-6 DIV. 4

(*ION EXCHANGE RESINS, CHEMICAL IMPURITIES, IONS, SODIUM, CALCIUM, THORIUM, NICKEL, ALUMINUM, PYROLYSIS, TEMPERATURE, CONDUCTIVITY, RESISTANCE, HALL EFFECT, PELLETS,) (*SEMICONDUCTORS, POLYMERS, THERMOELECTRICITY.)
PLASTICS LAB., PRINCETON U., N. J.
AD-273 726 2-2-6 DIV. 14

(*SEMICONDUCTORS, GALLIUM COMPOUNDS, ARSENIDES, SILICON, CRYSTALS, GROWTH, SILICON COMPOUNDS, DIODES, TWIN FILMS,) (*ELECTRONIC CIRCUITS, TANTALUM CAPACITORS, RESISTORS OF NICKEL ALLOYS AND CHROMIUM ALLOYS AND CAPACITORS OF SILICON AND DIOXIDES.) MANUFACTURING METHODS.
MOTOROLA, INC., PHOENIX, ARIZ.
AD-273 829 62-2-6 DIV. 8

(HIGH TEMPERATURE RESEARCH, *SEMICONDUCTORS, *GALLIUM COMPOUNDS, *ARSENIDES, *PHOSPHIDES, INTERMETALLIC COMPOUNDS,) (CRYSTALS, GROWTH, CRYSTALLIZATION, PRESSURE, ELECTRICAL PROPERTIES, RESISTANCE,) (TRANSPORT PROPERTIES, ARSENIC, VAPORS, CHEMICAL IMPURITIES, CARBON.)
DAVID SARNOFF RESEARCH CENTER, PRINCETON, N. J.
AD-273 865 62-2-6 DIV. 25

(*SEMICONDUCTORS, SILICON ALLOYS, ELECTRONIC CIRCUITS, MATERIALS, PROCESSING, MANUFACTURING METHODS, CHEMICAL MILLING, DIFFUSION, PACKAGING,) (*DIGITAL COMPUTERS, *SUBMINIATURE ELECTRONIC EQUIPMENT, *MINIATURE ELECTRONIC EQUIPMENT, ELECTRONIC CIRCUITS, SWITCHING CIRCUITS, TRANSISTORS, DIODES, RESISTORS, CAPACITORS, DESIGN, TESTING.)
TEXAS INSTRUMENTS INC., DALLAS, TEX.
AD-273 850 62-2-6 DIV. 8

***SHEAR STRESSES**

(THEORY, *BOUNDARY LAYER, *FLUID FLOW, *SHEAR STRESSES ALONG CYLINDRICAL BODIES,) (DRAG, TURBULENCE, LAMINAR BOUNDARY LAYER, FLUID MECHANICS, VISCOSITY,) (TOWING CABLES, *HYDRODYNAMICS, TESTS,)
TEXAS A. AND M. COLL., COLLEGE STATION.
AD-273 562 62-2-6 DIV. 9

***SHEETS**

(ALLOYS, *STEEL (A-286, AM-350, POTOMAC TYPE 422, ALTEMP R-41), *SHEETS FOR AIRFRAMES,) (MANUFACTURING METHODS, PROCESSING, MELTING, HEAT TREATMENT, ROLLING MILLS, *PRECISION FINISHING, *ELDING, *THICKNESS GAGES, QUALITY CONTROL,) TABLES.
ALLEGHENY LUDLUM STEEL CORP., BRACKENRIDGE, PA.
AD-273 932 62-2-6 DIV. 26

(METALS, *SHEETS, *BERYLLIUM, MANUFACTURING METHODS, PROCESSING,) (TESTS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, ELASTICITY, DEFORMATION, STRESSES,) (ALLOYS, STAINLESS STEEL (PH15-7MO,K4980), TITANIUM ALLOYS (TI6AL-4V),)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 707 2-2-6 DIV. 17

(*ROCKET CASES, MATERIALS, *SHEETS, *TITANIUM ALLOYS-BASE, ALUMINUM ALLOYS, CHROMIUM ALLOYS, VANADIUM ALLOYS, *WELDS, *FRACTURE (MECHANICS), HEAT TREATMENT, CRYSTAL STRUCTURE, MICROSTRUCTURE, AGING, HARDNESS, DATA.)
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 711 2-2-6 DIV. 17

(*FATIGUE (MECHANICS), SOLIDS, *ELASTICITY, *PLASTICITY, *DEFORMATION, *SHEETS, STRESSES, SHEAR STRESSES, LOAD DISTRIBUTION, MATHEMATICAL ANALYSIS, EQUATIONS.)
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
AD-273 832 62-2-6 DIV. 25

*SHIELDING

(*DIGITAL COMPUTERS, *PROGRAMMING OF *SHIELDING, PENETRATION OF *GAMMA RAY, *NEUTRON SPECTRUM FROM LEAKAGE OF *RESEARCH REACTORS.)
GENERAL DYNAMICS/FORT WORTH, TEX.
AD-273 498 62-2-6 DIV. 30

(*NEUTRONS AND GAMMA RAYS, *SHIELDING, TRANSMISSION, REFLECTION, TRANSPORT PROPERTIES.) (PARTICLES, PENETRATION, EMBEDDING SUBSTANCES.) (MATRIX ALGEBRA, DIFFERENCE EQUATIONS, NUMERICAL ANALYSIS, INTEGRATION.)
GENERAL DYNAMICS/FORT WORTH, TEX.
AD-273 641 62-2-6 DIV. 30

*SHIP PLATES

(*STEEL, *SHIP PLATES, *METAL PLATES, SHEETS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, MANUFACTURING METHODS, ROLLING MILLS, HEAT TREATMENT, FAILURE (MECHANICS), FRACTURE (MECHANICS), TEST METHODS, IMPACT SHOCK, MICROSTRUCTURE.)
NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
AD-273 767 62-2-6 DIV. 17

(*SUBMARINE HULLS, *SHIP PLATES, VIBRATION, DAMPING, TEMPERATURE, TESTS.)
STEEL, RUBBER, VULCANIZATES, PLASTICS, ORGANIC MATERIALS, ACETATES, VINYL RADICALS.
RUBBER LAB., MARE ISLAND NAVAL SHIPYARD, VALLEJO, CALIF.
AD-273 848 62-2-6 DIV. 31

*SHOCK

(*SYMPOSIA, *BIBLIOGRAPHY, *SHOCK, *VIBRATION, *ACOUSTIC IMPEDANCE.) (VIBRATION ISOLATORS, MECHANICAL PROPERTIES, RESISTANCE TO MOTION, DYNAMICS, DAMPING, EFFECTIVENESS.) (ACOUSTIC IMPEDANCE, MEASUREMENT, INSTRUMENTATION, TRANSDUCERS, CALIBRATION, SENSITIVITY, MATHEMATICAL ANALYSIS.)
ASSISTANT SECRETARY OF DEFENSE (RESEARCH AND ENGINEERING), WASHINGTON, D. C.
AD-273 516 62-2-6 DIV. 25

(*SYMPOSIA, *SHOCK, *VIBRATION, *PACKAGING, *TRANSPORTATION, MEASUREMENT, SIMULATION, DESIGN.) (RAILROADS, RAILROAD TRACKS, RAILROAD CARS, CARGO, SHIPPING.) (*MILITARY TRANSPORTATION, CARGO VEHICLES, TERRAIN, ROADS, SAILS.) (PACKAGING, CONTAINERS, STORAGE, MATERIALS, FOAM RUBBER, FOAMS, CELLULOSE, HANDLING, GUIDED MISSILES, NUCLEAR POWER PLANTS, DESIGN, TRAILERS, ELECTRONIC EQUIPMENT.) (AIR TRANSPORTATION, AIR DROP OPERATIONS, AIRBORNE, CONTAINERS.)
ASSISTANT SECRETARY OF DEFENSE, RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 515 62-2-6 DIV. 11

*SHROUDED PROPELLERS

(*SHROUDED PROPELLERS, *AERIAL PROPELLERS, AERODYNAMICS, PRESSURE, TRANSIENTS, TURBULENCE, INSTRUMENTATION.) (*PRESSURE GAGES, *PIEZOELECTRIC TRANSDUCERS, HARMONIC ANALYSIS, DESIGN, TESTS.) (PROPELLER NOISE, VIBRATION, TURBULENT BOUNDARY LAYER, INSTRUMENTATION.)
THERM, INC., ITHACA, N. Y.
AD-273 767 62-2-6 DIV. 9

*SILICON COMPOUNDS

(*SILICON COMPOUNDS, *METALLIC COMPOUNDS, *BORIDES, CARBIDES, NITRIDES, POWDER METALS, CRYSTAL STRUCTURE, PHYSICAL PROPERTIES, DENSITY, CHEMICAL PROPERTIES, HEAT OF FORMATION, SINTERING, HYDRAULIC PRESSES.) (SILICON COMPOUNDS, TITANIUM COMPOUNDS, CHROMIUM COMPOUNDS, BORIDES.) REFRACTORY MATERIALS, USSR, METALS AND CERAMICS LAB., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 801 62-2-6 DIV. 4

(*CERAMIC MATERIALS, *SILICON COMPOUNDS, DIOXIDES, PROCESSING OF *RADOMES BY PRESSURE, CASTING AND IMPREGNATION WITH ALUMINUM COMPOUNDS, CHLORIDES, POROSITY, MECHANICAL PROPERTIES.) (*GUIDED MISSILE NOSES, MANUFACTURING METHODS.)
GEORGIA INST. OF TECH., ENGINEERING EXPERIMENT STATION, ATLANTA.
AD-273 893 62-2-6 DIV. 14

*SINGLE CRYSTALS

(*SEMICONDUCTORS, INTERMETALLIC COMPOUNDS, *SINGLE CRYSTALS, *CADMIUM COMPOUNDS, *TELLURIDES, PHASE STUDIES, MELTING, GROWTH, ZONE MELTING, TEMPERATURE, ELECTRON OPTICS, REFLECTION, ABSORPTION, SPECTROGRAPHIC ANALYSIS, SOLID STATE PHYSICS.)
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
AD-273 623 62-2-6 DIV. 29

(*SINGLE CRYSTALS, CRYSTALS, *LITHIUM COMPOUNDS, *FLUORIDES, GROWTH, DETERIORATION, CORROSION, SOLUTIONS, CORROSIVE LIQUIDS, FATTY ACIDS, STEARIC ACIDS, CHEMICAL MILLING.)
RIAS, INC., BALTIMORE, MD.
AD-273 647 62-2-6 DIV. 29

(*SINGLE CRYSTALS, *X-RAY DIFFRACTION ANALYSIS, CRYSTAL STRUCTURE, GONIOMETERS.) (*DATA PROCESSING SYSTEMS, COMPUTERS, *PROGRAMMING, PUNCHED CARD METHODS.) (CAMERAS, PHOTOGRAPHS BY REFLECTION.) (ERRORS, ANALYSIS.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 719 2-2-6 DIV. 30

*SMALL ARMS

(DESIGN AND OPERATION OF *SMALL ARMS, *GUNS USED IN FIRING *BARBED WIRE FOR CONTROL OF PERSONNEL.) WIRE, CONTAINERS, PACKAGING.
FRANKFORD ARSENAL, PHILADELPHIA, PA.
AD-273 834 62-2-6 DIV. 22

*SODIUM

(*SPECTROGRAPHIC ANALYSIS, MOLECULAR SPECTROSCOPY, RARE GASES AND ELEMENTS.) (SPECTROGRAPHIC DATA, RECORDING DEVICES, *INTERFEROMETERS, TEMPERATURES, MEASUREMENT.) (*SODIUM AND *CESIUM, *CLOUDS IN THE *UPPER ATMOSPHERE.)
GEORGIA U., ATHENS.
AD-273 763 62-2-6 DIV. 25

*SOLAR CELLS

(*SOLAR CELLS FOR *ELECTRIC POWER PRODUCTION, THERMAL RADIATION, SOLAR ENERGY.) (SUN, TRACKING, FOCUSING, DETECTION.) (ROTATING STRUCTURES, DESIGN, SENSITIVITY, TESTS.) (POWER SUPPLIES, FEASIBILITY STUDIES.)
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 551 62-2-6 DIV. 7

(SOLAR FURNACES, PHOTOCHEMISTRY, *PHOTOCHEMICAL REACTIONS, PHOTOLYSIS, CHLORINE, *OXYCHLORIDES, *NITROGEN COMPOUNDS, OXIDES, LIGHT, SOLAR ENERGY, CARBON TETRACHLORIDE.) (*SOLAR CELLS, POWER SUPPLIES.) RECOMBINATION REACTIONS.
STANFORD RESEARCH INST., MENLO PARK, CALIF.
AD-273 662 62-2-6 DIV. 7

(*PHOTOELECTRIC CELLS, *SOLAR CELLS, GALLIUM COMPOUNDS, ARSENIDES, PHOSPHIDES, MANUFACTURING METHODS, DIFFUSION.) *ELECTRIC POWER PRODUCTION, POWER SUPPLIES, SOLAR ENERGY, THERMOELECTRICITY.
EAGLE-PICHER RESEARCH LABS., MIAMI, OKLA.
AD-273 807 62-2-6 DIV. 7

*SOLAR DISTURBANCES

(*MAGNETOHYDRODYNAMICS, *EXTREMELY LOW FREQUENCY, *ELECTROMAGNETIC WAVES, MAGNETIC FIELDS, OSCILLATIONS, CONDUCTIVITY, WAVES.) (*TERRESTRIAL MAGNETISM, *SOLAR DISTURBANCES, *FLUID FLOW.) (TRANSFORMATIONS (MATHEMATICS), PARTIAL DIFFERENTIAL EQUATIONS, PERTURBATION THEORY.)
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 492 62-2-6 DIV. 25

(*INTERFEROMETERS, VERY HIGH FREQUENCY.) (*SOLAR DISTURBANCES, SOLAR NOISE, MEASUREMENT, RADIO SIGNALS, PHASE MEASUREMENT, POSITION FINDING.) *RADIO ASTRONOMY.
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 788 62-2-6 DIV. 2

*SOLAR ENERGY

(*CRYOGENICS, FEASIBILITY STUDIES, *INFRARED RADIATION, *SOLAR ENERGY, *REFRIGERANT CONDENSERS, SHIELDING, VACUUM SYSTEMS, NITROGEN.) (INSTRUMENTATION, MEASUREMENT, VACUUM PUMPS, DESIGN, IONIZATION, GAGES.) (HEAT TRANSFER, THERMAL DIFFUSION, ALUMINUM.)
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
AD-273 739 2-2-6 DIV. 25

*SOLAR SPECTRUM

(*SOLAR SPECTRUM, *SCATTERING OF *INFRARED RADIATION IN ATMOSPHERE.) (ASTRONOMICAL OBSERVATORIES, TELESCOPES, MONOCHROMATIC LIGHT.) (AIR MASS ANALYSIS, PRECIPITATION, WATER.) ASTRONOMICAL DATA, ARIZONA, ARIZONA STATE COLL., FLAGSTAFF.
AD-273 599 62-2-6 DIV. 2

(*SOLAR ATMOSPHERE, *INFRARED RADIATION, MICROWAVES, ULTRAVIOLET RADIATION, METEOROLOGY, SOLAR FLARES, *SOLAR SPECTRUM, ASTRONOMICAL OBSERVATORIES.) (RESEARCH PROGRAM ADMINISTRATION, SCIENTIFIC REPORTS.)
ARIZONA STATE COLL., FLAGSTAFF.
AD-273 639 62-2-6 DIV. 2

*SOLID ROCKET PROPELLANTS

(THERMODYNAMICS, *SOLID ROCKET PROPELLANTS, COMBUSTION, COMBUSTION CHAMBER GASES.) (VAPORIZATION, VAPOR PRESSURE OF *BORON COMPOUNDS, OXIDES, *LITHIUM COMPOUNDS, OXIDES, LITHIUM COMPOUNDS, BORATES, *BERYLLIUM COMPOUNDS, FLUORIDES.) (SPECIFIC HEAT, MEASUREMENT, TEST METHODS, TANTALUM, TESTS.) (MASS SPECTROSCOPY OF BORON COMPOUNDS, OXIDES, MAGNESIUM COMPOUNDS, FLUORIDES, IONIZATION.) (DATA, TABLES.)
AERONUTRONIC, NEWPORT BEACH, CALIF.
AD-273 792 62-2-6 DIV. 10

(*SOLID ROCKET PROPELLANTS, BONDING TO ROCKET CASES OF *ROCKET MOTORS.) (PROPELLANT GRAINS, ELASTICITY, PLASTICITY, VISCOSITY, STRESSES, THERMAL STRESSES, THERMODYNAMICS, TEMPERATURE, FAILURE (MECHANICS), TESTS, TEST METHODS.)
LOCKHEED PROPULSION CO., REDLANDS, CALIF.
AD-273 871 62-2-6 DIV. 27

*SOLIDS

(*PENETRATION OF *PARTICLES INTO *SOLIDS, SOLID STATE PHYSICS.) (ENERGY, WAVE TRANSMISSION, ELASTIC SCATTERING.) (PLASTICITY, DEFORMATION, ELASTICITY, *STRESSES, SHEAR STRESSES, *PHASE TRANSITIONS.) (HYDRODYNAMICS, JETS.) (*CRATERING AND IMPACT SHOCK OF METEORITES.)
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
AD-273 718 2-2-6 DIV. 25

(*SOLIDS, SURFACES, *FRICTION, VELOCITY, TEMPERATURE, TEST EQUIPMENT, TEST METHODS.) (STEEL, ZINC, TUNGSTEN COMPOUNDS, CARBIDES, TIN, CAST IRON, BRASS, COPPER, ALUMINUM, LEAD, CHROMIUM, LOAD DISTRIBUTION, LOADING, HEAT TRANSFER, EROSION, METALS, BEARINGS.)
UTAH U. COLL. OF ENGINEERING, SALT LAKE CITY.
AD-273 789 62-2-6 DIV. 25

*SONAR EQUIPMENT

(SONAR, *ANTENNA RADIATION PATTERNS, VERY LOW FREQUENCY, *TRANSDUCERS, CALIBRATION, TESTS, MEASUREMENT IN WATER TUNNELS, TEST FACILITIES.) (ANTISUBMARINE WARFARE, *SONAR EQUIPMENT, SCANNING SONAR, DIRECTION FINDING, PRESSURE, PHASE MEASUREMENT, DETERMINATION.) *ELECTROACOUSTIC TRANSDUCERS.
DEFENSE RESEARCH LAB., U. OF TEXAS, AUSTIN.
AD-273 522 62-2-6 DIV. 6

*SONAR SIGNALS

(*DETECTION OF *SONAR SIGNALS, *UNDERWATER SOUND SIGNALS, *UNDERWATER SOUND IN PRESENCE OF NOISE USING CORRELATION TECHNIQUES.) SIGNAL-TO-NOISE RATIO, ACOUSTICS, ACOUSTIC DETECTORS, FOURIER ANALYSIS, INTEGRAL TRANSFORMS.
LITTON SYSTEMS, INC., GALTHAM, MASS.
AD-273 639 62-2-6 DIV. 6

*SOUND

(*BOOSTER ROCKETS, LAUNCHING, NOISE, *ACOUSTICS, MEASUREMENT, FREQUENCY.) (*SOUND, VIBRATION, PRESSURE.)
AEROSPACE MEDICAL DIV., WRIGHT AIR DEVELOPMENT DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 666 62-2-6 DIV. 27

*SPACE CHARGES

(*ELECTRON BEAMS, *LINEAR SYSTEMS, *ELECTRON TUBES, MICROWAVE FREQUENCY, THEORY.) (ELECTRONIC CIRCUITS, ELECTRON BEAMS, INTERACTION.) (ELECTRON BEAMS, VELOCITY, MODULATION, DISTRIBUTION, MEASUREMENT, MATHEMATICAL ANALYSIS, CAVITY RESONATORS, ELECTRON GUNS.) (ELECTRON BEAMS, ELECTROMAGNETIC FIELDS, *SPACE CHARGES, *MICROWAVES, THEORY, MATHEMATICAL ANALYSIS, KLYSTRONS, NONLINEAR SYSTEMS, MICROWAVE AMPLIFIERS.)
CORNELL U. SCHOOL OF ELECTRICAL ENGINEERING, ITHACA, N. Y.
AD-273 803 62-2-6 DIV. 8

*SPACE ENVIRONMENTAL CONDITIONS

(MEASUREMENT, *ELECTRICAL CONDUCTANCE OF AIR, IONIZATION DURING *RE-ENTRY AERODYNAMICS.) (*INSTRUMENTATION, DESIGN OF SHOCK WAVES, *CONDUCTIVITY, *METERS FOR SATELLITE VEHICLES.) (CALIBRATION AND FLIGHT TESTING UNDER *SPACE ENVIRONMENTAL CONDITIONS.) (MAGNETOHYDRODYNAMICS, EXPERIMENTAL DATA, RELIABILITY.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 478 62-2-6 DIV. 9

(SIMULATION OF *SPACE ENVIRONMENTAL CONDITIONS ON THE *MOON; *VACUUM SYSTEMS.) (ANALYSIS; TESTS OF IMPACT SHOCK IN *VOLCANIC DUST AND ROCK.) (FEASIBILITY STUDIES AND *TEST METHODS; EXPERIMENTAL DATA; PHOTOGRAPHIC ANALYSIS; THESES.
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 604 62-2-6 DIV. 2

(SATELLITE VEHICLES; SOUNDING ROCKETS; HIGH ALTITUDE METEOROLOGICAL BALLOONS; LUNAR PROBES; *GEOPHYSICAL EXPLORATIONS OF *UPPER ATMOSPHERE AND *SPACE ENVIRONMENTAL CONDITIONS.) (INSTRUMENTATION; TESTS.) (DENSITY; PRESSURE; TEMPERATURE; ULTRAVIOLET RADIATION; ELECTROMAGNETIC PROPERTIES; IONS; ELECTRONS; PLASMA PHYSICS; COSMIC RAYS; GAMMA RAYS; NOISE (RADIO); RADIOMETERS; GEODESICS; METEORITES; MOON; SURFACE PROPERTIES; METEOROLOGY; ATMOSPHERE MODELS.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 758 62-2-6 DIV. 2

***SPACE FLIGHT**

(SATELLITE VEHICLES; SPACESHIPS; *ORBITAL FLIGHT PATHS; SEPARATION; TAKE-OFF; SPACE FLIGHT; *CELESTIAL MECHANICS; DYNAMICS; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; INTEGRAL EQUATIONS; BESSEL FUNCTIONS; PERTURBATION THEORY.) (MOTION; EQUATIONS.)
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 479 62-2-6 DIV. 12

***SPACE PERCEPTION**

(*MOTION SICKNESS; STIMULATION; MOTION; ROTATION; ACCELERATION.) (SENSORY PERCEPTION; *SPACE PERCEPTION; EYE; EAR.)
AEROSPACE MEDICAL LAB., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 602 62-2-6 DIV. 16

***SPACE PROBES**

(*SATELLITE VEHICLES; *SPACE PROBES; ROCKET MOTORS; BOOSTER ROCKETS; ERRORS IN FLIGHT PATHS DUE TO STAGING; SEPARATION.) (SIMULATION OF *STAGING; TEST FACILITIES; DESIGN; DYNAMICS; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; INTEGRAL EQUATIONS.) (EXPERIMENTAL DATA; MATHEMATICAL ANALYSIS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 564 62-2-6 DIV. 12

***SPARK SHADOWGRAPH PHOTOGRAPHY**

(DESIGN OF *EXPLOSIVES; *LIGHT SOURCES IN AN ARGON, ATMOSPHERE FOR USE IN *SPARK SHADOWGRAPH PHOTOGRAPHY OF SUPERSONIC FLOW OF AIR THROUGH GLASS NOZZLES.) HIGH SPEED PHOTOGRAPHY.
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
AD-273 560 62-2-6 DIV. 22

***SPECIFIC IMPULSE**

(*LIQUID ROCKET PROPELLANTS; *ROCKET OXIDIZERS; ROCKET MOTORS; *SPECIFIC IMPULSE; MATHEMATICAL ANALYSIS.) (LIQUEFIED GASES; OXYGEN; NITROGEN COMPOUNDS; TETROXIDES; HYDRAZINES; METHYL HYDRAZINES; AMMONIA; CHLORIDES; PERCHLORYL RADICALS; FLUORINE; FLUORIDES; PENTABORANES; HYDROGEN; HYDROGEN COMPOUNDS; PERCXIDES; PERCHLORATES.) *HANDBOOKS; TABLES.
AEROSPACE CORP., EL SEGUNDO, CALIF.
AD-273 675 62-2-6 DIV. 10

***SPECTROGRAPHIC ANALYSIS**

(*IONS; *THRUST AUGMENTOR NOZZLES; TESTS; *ELECTRONS.) (ROCKET MOTOR PRESSURE; TEMPERATURE; MEASUREMENT.) (*SPECTROGRAPHIC ANALYSIS; OPTICS; DETECTION; BLACKBODY RADIATION.) (*GAS FLOW; *PLASMA PHYSICS.) (NUMERICAL ANALYSIS, INTEGRAL EQUATIONS.)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 540 62-2-6 DIV. 20

(*SPECTROGRAPHIC ANALYSIS; MOLECULAR SPECTROSCOPY; RARE GASES AND ELEMENTS.) (SPECTROGRAPHIC DATA; RECORDING DEVICES; *INTERFEROMETERS; TEMPERATURES, MEASUREMENT.) (*SODIUM AND *CESIUM; *CLOUDS IN THE *UPPER ATMOSPHERE.)
GEORGIA U., ATHENS.
AD-273 763 62-2-6 DIV. 25

***SPEECH**

(*DATA PROCESSING SYSTEMS; *DIGITAL COMPUTERS; *COMPUTERS, MEMORY DEVICES; CIRCUITS; ANALOG-TO-DIGITAL CONVERTERS; DESIGN; MAGNETIC MATERIALS; FILMS.) (PSYCHOLOGY; *SPEECH; AUTOMATIC, SPEECH REPRESENTATION.) MATHEMATICAL ANALYSIS.
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
AD-273 508 62-2-6 DIV. 30

(*VOICE COMMUNICATION SYSTEMS; *SPEECH TRANSMISSION; RADIO COMMUNICATION SYSTEMS; RADIO INTERFERENCE; INTERFERENCE; SIGNAL-TO-NOISE RATIO; *SPEECH, INTELLIGIBILITY; *TEST SETS; AUTOMATIC; MONITORS; DESIGN.) (RADIO INTERFERENCE ANALYZERS; EFFECTIVENESS; TESTS.)
GEORGIA INST. OF TECH ENGINEERING EXPERIMENT STATION, ATLANTA.
AD-273 898 62-2-6 DIV. 5

***SPEECH TRANSMISSION**

(*VOICE COMMUNICATION SYSTEMS; *SPEECH TRANSMISSION; RADIO COMMUNICATION SYSTEMS; RADIO INTERFERENCE; INTERFERENCE; SIGNAL-TO-NOISE RATIO; *SPEECH, INTELLIGIBILITY; *TEST SETS; AUTOMATIC; MONITORS; DESIGN.) (RADIO INTERFERENCE ANALYZERS; EFFECTIVENESS; TESTS.)
GEORGIA INST. OF TECH ENGINEERING EXPERIMENT STATION, ATLANTA.
AD-273 898 62-2-6 DIV. 5

***SPHERES**

(THEORY OF *PROPAGATION OF *ELECTROMAGNETIC WAVES AROUND *SPHERES; EARTH.) (*TERRESTRIAL MAGNETISM; CONDUCTIVITY; DIELECTRICS; ATTENUATION.) (*WAVE ANALYSIS; POLYNOMIALS; INTEGRAL EQUATIONS; TRANSFORMATIONS (MATHEMATICS).) NUMERICAL ANALYSIS BY COMPUTERS.
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 463 62-2-6 DIV. 25

(*ALGEBRAIC TOPOLOGY; GROUPS (MATHEMATICS); *FUNCTIONAL ANALYSIS; TRANSFORMATIONS (MATHEMATICS); SEQUENCES; SCHEDULING; *SPHERES.)
INSTITUTE OF MATHEMATICAL SCIENCES, NEW YORK U., N. Y.
AD-273 664 62-2-6 DIV. 15

***SPOT WELDING**

(ALLOYS; *ALUMINUM ALLOYS (2024, 2014; 7075; 5052; 5086); WELDING; *SPOT WELDING; *ELECTRIC WELDING; RESISTANCE MANUFACTURING METHODS; AUTOMATION FOR QUALITY CONTROL.) (EFFECT OF ELECTRODES; GROWTH; TIME; THICKNESS; ELECTRIC CURRENTS ON ELECTRICAL PROPERTIES; RESISTANCE OF SPOT WELDS.) TABLES.
BUDD CO., PHILADELPHIA, PA.
AD-273 477 62-2-6 DIV. 26

***STABILITY (LATERAL)**

(*HYPERVELOCITY VEHICLES; JET PLANES; HYPERSONICS; *STABILITY (LATERAL); STABILITY; OSCILLATION; ROLL; YAW; AMPING; STABILIZATION SYSTEMS; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; THEORY.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 568 62-2-6 DIV. 9

***STABILIZATION SYSTEMS**

(*ROCKET PLANES; RESEARCH PLANES; HYPERVELOCITY VEHICLES; STABILIZATION SYSTEMS; DAMPING.) (*STABILIZATION SYSTEMS; SERVO SYSTEMS; DESIGN; FLIGHT TESTING; RELIABILITY; VIBRATION; HAZARDS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 565 62-2-6 DIV. 1

***STAGING**

(*SATELLITE VEHICLES; *SPACE PROBES; ROCKET MOTORS; BOOSTER ROCKETS; ERRORS IN FLIGHT PATHS DUE TO STAGING; SEPARATION.) (SIMULATION OF *STAGING; TEST FACILITIES; DESIGN; DYNAMICS; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; INTEGRAL EQUATIONS.) (EXPERIMENTAL DATA; MATHEMATICAL ANALYSIS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 564 62-2-6 DIV. 12

***STAINLESS STEEL**

(MATERIALS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; PHYSICAL PROPERTIES; TEST METHODS.) (*ADHESIVES; RESIN ADHESIVES; RUBBER ADHESIVES; *LAMINATES; RESINS; PLASTICS; GLASS TEXTILES; *SEALS; *SEALING COMPOUNDS.) (*ALLOYS; *STEEL (4130; 15-7PH, 4340; 300F); *STAINLESS STEEL (AM 350; A286, AM 355; 321; 422; PH 15-7 MO; 17-4 PH); *ALUMINUM ALLOYS (7075-T73; X2219-T6); VANADIUM ALLOYS.) (*HONEYCOMB CORES; SANDWICH CONSTRUCTION; BRAZING; SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X; RENE' 41; M-252; INCONEL 718); CHROMIUM ALLOYS; COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

(MATERIALS; *PHYSICAL PROPERTIES; THERMODYNAMICS; CORROSION; MECHANICAL PROPERTIES; TEST METHODS.) (*ABLATION; *COATINGS; ELECTRIC INSULATION; *GLASS TEXTILES; GRAPHITE; LAMINATES, ENCAPSULATION; EMBEDDING SUBSTANCES; *ZIRCONIUM COMPOUNDS; DIOXIDES.) (*STAINLESS STEEL (PH15-7MO); *HONEYCOMB CORES; SANDWICH PANELS.) (*TOOL STEEL (HGR PUNCH AND DIE; OLYMPIC FM DIE; SELECT B DIE; JET FORGE TOOL; VASCO 7152 TOOL; CK SPECIAL TOOL); CIES.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 801 62-2-6 DIV. 14

***STANDARDS**

(*DATA; *STANDARDS; SPECIFICATIONS; HANDBOOKS.) (*MILITARY EQUIPMENT; *AIR FORCE EQUIPMENT; *AIR FORCE SUPPLIES; STANDARDIZATION; MILITARY REQUIREMENTS; PRODUCTION; CONTROL; MANAGEMENT ENGINEERING.)
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 890 62-2-6 DIV. 29

***STARS**

(*RADIO ASTRONOMY; *INTERFEROMETERS; *OPTICAL TRACKING OF *SATELLITE VEHICLES; SPACE FLIGHT.) (CALIBRATION; OPTICAL EQUIPMENT; RADIO SIGNALS; SIGNAL-TO-NOISE RATIO.) (ORBITAL FLIGHT PATHS OF GALAXIES; *STARS.) CELESTIAL MECHANICS.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 488 62-2-6 DIV. 2

***STATISTICAL ANALYSIS**

(FEASIBILITY STUDIES OF *CONDITIONED REFLEX; *MEMORY DEVICES; FEEDBACK; CONTROL SYSTEMS; DESIGN.) (*MATHEMATICAL LOGIC, SEQUENCES; CODING, PROGRAMMING; SWITCHING CIRCUITS.) (*STATISTICAL ANALYSIS; PROBABILITY; SAMPLING; STATISTICAL DISTRIBUTIONS; *INFORMATION THEORY.)
SCOPE, INC., FALLS CHURCH, VA.
AD-273 530 62-2-6 DIV. 30

***STEAM**

(COMBUSTION CHAMBERS; COMBUSTION CHAMBER GASES; WATER; *STEAM.) (ROCKET MOTORS; EXHAUST GASES; JET MIXING FLOW; STEAM.) (*ROCKET LABORATORIES; INSTRUMENTATION; SPECIFIC IMPULSE.) *GAS GENERATING SYSTEMS.
ARNOLD ENGINEERING DEVELOPMENT CENTER; ARNOLD AIR FORCE STATION, TENN.
AD-273 488 62-2-6 DIV. 25

***STEEL**

(ALLOYS; *STEEL (A-286; AM-350; POTOMAC TYPE 422; ALTEMP R-41); *SHEETS FOR AIRFRAMES.) (MANUFACTURING METHODS; PROCESSING; MELTING; HEAT TREATMENT; ROLLING MILLS; *PRECISION FINISHING; WELDING; *THICKNESS GAGES; QUALITY CONTROL.) TABLES.
ALLEGHENY LUDLUM STEEL CORP., BRACKENRIDGE, PA.
AD-273 532 62-2-6 DIV. 26

(METALS; *STEEL, SHEETS; *FAILURE (MECHANICS); *FRACTURE (MECHANICS); GRAINS (METALLURGY); THICKNESS; HEAT TREATMENT, TEMPERATURE.) (MECHANICAL PROPERTIES; TENSILE PROPERTIES.)
AUBURN RESEARCH FOUNDATION, ALABAMA POLYTECHNIC INST.
AD-273 672 62-2-6 DIV. 17

(*STEEL; *COATINGS; *PLASTIC COATINGS; RESINS; POLYMERS; FLUORIDES; ETHYLENES; SURFACES, SANDBLASTING; ADHESION; CORROSION INHIBITION; LUBRICATION; TESTS.)
NAVAL WEAPONS PLANT, WASHINGTON, D. C.
AD-273 714 2-2-6 DIV. 14

(*STEEL; *SHIP PLATES; *METAL PLATES, SHEETS; MECHANICAL PROPERTIES; TENSILE PROPERTIES; MANUFACTURING METHODS; ROLLING MILLS; HEAT TREATMENT; FAILURE (MECHANICS); FRACTURE (MECHANICS); TEST METHODS; IMPACT SHOCK; MICROSTRUCTURE.)
NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
AD-273 767 62-2-6 DIV. 17

(MATERIALS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; PHYSICAL PROPERTIES; TEST METHODS.) (*ADHESIVES; RESIN ADHESIVES; RUBBER ADHESIVES; *LAMINATES; RESINS; PLASTICS; GLASS TEXTILES; *SEALS; *SEALING COMPOUNDS.) (*ALLOYS; *STEEL (4130; 15-7PH, 4340; 300F); *STAINLESS STEEL (AM 350; A286, AM 355; 321; 422; PH 15-7 MO; 17-4 PH); *ALUMINUM ALLOYS (7075-T73; X2219-T6); VANADIUM ALLOYS.) (*HONEYCOMB CORES; SANDWICH CONSTRUCTION; BRAZING; SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X; RENE' 41; M-252; INCONEL 718); CHROMIUM ALLOYS; COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

(SOLID ROCKET PROPELLANTS; *ROCKET MOTORS; *ROCKET CASES; MANUFACTURING METHODS; DRAWING (MACHINE PROCESSING); HEAT TREATMENT; MACHINE TOOLS; DIES.) (METALS; ALLOYS; *STEEL; *TITANIUM ALLOYS; NICKEL ALLOYS; PROCESSING; HARDENING; MICROSTRUCTURE.)
LYDA INC., DETROIT, MICH.
AD-273 826 62-2-6 DIV. 27

***STEREOCHEMISTRY**

(*STEREOCHEMISTRY, *X-RAY DIFFRACTION ANALYSIS, *POWDERS, *COMPLEX COMPOUNDS, *COMPLEX IONS, TRANSITION ELEMENTS, ARSINES, PYRIDINES, HALIDES, *CHELATE COMPOUNDS, CHROMIUM COMPOUNDS, MOLYBDENUM COMPOUNDS, TUNGSTEN COMPOUNDS, MOLECULAR STRUCTURE.)
UNIVERSITY COLL., LONDON (ENGLAND).
AD-273 694 62-2-6 DIV. 25

***STORAGE TUBES**

(*STORAGE TUBES, *DISPLAY SYSTEMS, *THIN FILMS, *DIELECTRIC FILMS, ZINC COMPOUNDS, SULFIDES, *ELECTRON BOMBARDMENT, ION BOMBARDMENT, ELECTRICAL CONDUCTANCE, PROCESSING, HEAT TREATMENT, CRYSTALS, GROWTH, X-RAY DIFFRACTION ANALYSIS.)
HUGHES AIRCRAFT CO., MALIBU, CALIF.
AD-273 628 62-2-6 DIV. 8

***STORMS**

(*WEATHER FORECASTING OF *THUNDERCLOUDS AND *STORMS BY STATISTICAL ANALYSIS OF MOISTURE, WIND AND PRESSURE OF ATMOSPHERE.)
RAND CORP., SANTA MONICA, CALIF.
AD-273 518 62-2-6 DIV. 2

***STRESSES**

(*WAVE TRANSMISSION, *STRESSES, *BLAST (LOADING), *DEFORMATION, ELASTICITY, PLASTICITY, MECHANICS.) (DISLOCATIONS OF *CRYSTAL STRUCTURE, LATTICES IN SOLIDS, *RODS, *STRUCTURAL SHELLS, ELASTIC SHELLS.) (POTENTIAL THEORY, PARTIAL DIFFERENTIAL EQUATIONS, HARMONIC ANALYSIS, FOURIER ANALYSIS.) CONTINUUM MECHANICS, LOAD DISTRIBUTION.
AMERICAN MACHINE AND FOUNDRY CO., NILES, ILL.
AD-273 534 62-2-6 DIV. 25

(*PENETRATION OF *PARTICLES INTO *SOLIDS, SOLID STATE PHYSICS.) (ENERGY, WAVE TRANSMISSION, ELASTIC SCATTERING.) (PLASTICITY, DEFORMATION, ELASTICITY, *STRESSES, SHEAR STRESSES, *PHASE TRANSITIONS.) (HYDRODYNAMICS, JETS.) (*CRATERING AND IMPACT SHOCK OF METEORITES.)
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
AD-273 718 62-2-6 DIV. 25

(*STRUCTURES, *STRUCTURAL SHELLS, DEFORMATION, *BUCKLING, FAILURE (MECHANICS).) (*STRESSES, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS.)
BROWN U., PROVIDENCE, R. I.
AD-273 797 62-2-6 DIV. 25

***STRUCTURAL SHELLS**

(*WAVE TRANSMISSION, *STRESSES, *BLAST (LOADING), *DEFORMATION, ELASTICITY, PLASTICITY, MECHANICS.) (DISLOCATIONS OF *CRYSTAL STRUCTURE, LATTICES IN SOLIDS, *RODS, *STRUCTURAL SHELLS, ELASTIC SHELLS.) (POTENTIAL THEORY, PARTIAL DIFFERENTIAL EQUATIONS, HARMONIC ANALYSIS, FOURIER ANALYSIS.) CONTINUUM MECHANICS, LOAD DISTRIBUTION.
AMERICAN MACHINE AND FOUNDRY CO., NILES, ILL.
AD-273 534 62-2-6 DIV. 25

(*STRUCTURES, *STRUCTURAL SHELLS, DEFORMATION, *BUCKLING, FAILURE (MECHANICS).) (*STRESSES, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS.)
BROWN U., PROVIDENCE, R. I.
AD-273 797 62-2-6 DIV. 25

***STRUCTURES**

(*STRUCTURES, *STRUCTURAL SHELLS, DEFORMATION, *BUCKLING, FAILURE (MECHANICS).) (*STRESSES, MATHEMATICAL ANALYSIS, DIFFERENTIAL EQUATIONS.)
BROWN U., PROVIDENCE, R. I.
AD-273 797 62-2-6 DIV. 25

***SUBMARINE HULLS**

(*SUBMARINE HULLS, *SHIP PLATES, VIBRATION, DAMPING, TEMPERATURE, TESTS.)
STEEL, RUBBER, VULCANIZATES, PLASTICS, ORGANIC MATERIALS, ACETATES, VINYL RADICALS, RUBBER LAB., MARE ISLAND NAVAL SHIPYARD, VALLEJO, CALIF.
AD-273 840 62-2-6 DIV. 31

***SUBMARINES**

(*BIBLIOGRAPHY, *ANTISUBMARINE WARFARE, *SUBMARINES, *TORPEDOES, *OCEANOGRAPHY.) (UNDERSEA WARFARE, CONTROL SYSTEMS, NUCLEAR PROPULSION, SUBMARINE PERISCOPES, SUBMARINE NOISE.)
AUTONETICS, DOWNEY, CALIF.
AD-273 660 62-2-6 DIV. 31

***SUBMINIATURE ELECTRONIC EQUIPMENT**

(*TRANSISTORS, GERMANIUM, SILICON, SEMICONDUCTORS, *PACKAGING, *SUBMINIATURE ELECTRONIC EQUIPMENT, PRODUCTION, *MANUFACTURING METHODS, DESIGN, TESTS.)
SYLVANIA ELECTRIC PRODUCTS, INC., WOBURN, MASS.
AD-273 868 62-2-6 DIV. 8

(*SEMICONDUCTORS, SILICON ALLOYS, ELECTRONIC CIRCUITS, MATERIALS, PROCESSING, MANUFACTURING METHODS, CHEMICAL MILLING, DIFFUSION, PACKAGING.) (*DIGITAL COMPUTERS, *SUBMINIATURE ELECTRONIC EQUIPMENT, *MINIATURE ELECTRONIC EQUIPMENT, ELECTRONIC CIRCUITS, SWITCHING CIRCUITS, TRANSISTORS, DIODES, RESISTORS, CAPACITORS, DESIGN, TESTING.)
TEXAS INSTRUMENTS INC., DALLAS, TEX.
AD-273 830 62-2-6 DIV. 8

***SUN**

(ASTRONOMY, *SUN, *TRACKING BY *COMMUNICATION SYSTEMS, INTERFEROMETERS, *ELECTRICAL NETWORKS, ANTENNAS.) (SOLAR DISTURBANCES, SOLAR FLARES, SOLAR CORONA, NOISE (RADIO).) (INSTRUMENTATION, PREAMPLIFIERS, DETECTORS, BAND-PASS FILTERS, RECORDING DEVICES.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 857 62-2-6 DIV. 2

***SUPERSONIC WIND TUNNELS**

(*SUPERSONIC WIND TUNNELS, WIND TUNNELS AND WIND TUNNEL NOZZLES, AERODYNAMICS, SUPERSONICS, CALIBRATION, PRESSURE, ERRORS, MACH NUMBER, MEASUREMENT.) HUMIDITY.
ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AIR FORCE STATION, TENN.
AD-273 527 62-2-6 DIV. 30

(*TRANSONIC WIND TUNNELS, *SUPERSONIC WIND TUNNELS, WIND TUNNELS, WIND TUNNEL MODELS, INSTRUMENTATION, OSCILLATION.) (AERODYNAMIC CONFIGURATIONS, STABILITY (LONGITUDINAL), STABILITY (LATERAL), DAMPING, STABILITY, TEST METHODS.) (*VIBRATION MECHANISMS BY HYDRAULIC SYSTEMS, DESIGN, TESTS.) (WING-BODY CONFIGURATIONS, SWEPT-BACK WINGS, TRANSONICS, AERODYNAMICS, MODEL TESTS.) (BALANCES, EXPERIMENTAL DATA, MATHEMATICAL ANALYSIS, ERRORS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 569 62-2-6 DIV. 30

(WIND TUNNELS, *SUPERSONIC WIND TUNNELS, HIGH TEMPERATURE RESEARCH, SIMULATION OF *GAS FLOW OF AIR BY EXHAUST GASES, THERMODYNAMICS, MATHEMATICAL ANALYSIS, TESTS.) (AERODYNAMICS, HEAT TRANSFER, AERODYNAMIC HEATING, TEST METHODS, TEST FACILITIES.) (*HYDROCARBONS AFTER COMBUSTION WITH ARGON, HELIUM, OXYGEN, PHYSICAL PROPERTIES.) (PIPES, GAS FLOW, DRAG, HEAT TRANSFER, MATHEMATICAL ANALYSIS, TESTS.)
ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AIR FORCE STATION, TENN.
AD-273 674 62-2-6 DIV. 9

***SWITCHING CIRCUITS**

(*PHASE SHIFTERS, TRIODES, DIGITAL SYSTEMS, *SWITCHING CIRCUITS, PHASE MEASUREMENT, L BAND, ULTRA HIGH FREQUENCY, ELECTRONIC SWITCHES, DESIGN.) (RADAR ANTENNAS, *TRANSMISSION LINES, ELECTRONIC CIRCUITS, NARROWBAND, RADAR EQUIPMENT, DESIGN.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 631 62-2-6 DIV. 8

(*MILITARY COMMUNICATIONS, *COMMUNICATION SYSTEMS, DESIGN, DATA TRANSMISSION SYSTEMS, VOICE COMMUNICATION SYSTEMS, SECRET COMMUNICATION SYSTEMS, TELETYPE SYSTEMS, RADIO COMMUNICATION SYSTEMS, TELEPHONE COMMUNICATION SYSTEMS, FACSIMILE COMMUNICATION SYSTEMS.) (*COMMUNICATION EQUIPMENT, ELECTRONIC SWITCHES, *SWITCHING CIRCUITS, ANALOG SYSTEMS, DIGITAL SYSTEMS, TRANSMISSION.)
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 682 62-2-6 DIV. 5

(*CRYOGENICS, MATHEMATICAL LOGIC, COMPUTERS, *DATA PROCESSING SYSTEMS, THIN FILMS.) (*SWITCHING CIRCUITS, ELECTRONIC CIRCUITS, SUPERCONDUCTORS, TRIGGER CIRCUITS.) (THERMAL CONDUCTIVITY, MEASUREMENT, MATERIALS.) (*MEMORY DEVICES, DESIGN.)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 735 2-2-6 DIV. 30

(*CRYOGENICS, *DATA PROCESSING SYSTEMS, THIN FILMS OF TIN AND INDIUM, CIRCUITS, SUPERCONDUCTORS.) (*SWITCHING CIRCUITS, *MEMORY DEVICES, MATERIALS, DESIGN, MATHEMATICAL LOGIC.)
INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, N. Y.
AD-273 736 2-2-6 DIV. 30

***SYMPOSIA**

(*SYMPOSIA, *BIBLIOGRAPHY, *SHOCK, *VIBRATION, *ACOUSTIC IMPEDANCE.) (VIBRATION ISOLATORS, MECHANICAL PROPERTIES, RESISTANCE TO MOTION, DYNAMICS, DAMPING, EFFECTIVENESS.) (ACOUSTIC IMPEDANCE, MEASUREMENT, INSTRUMENTATION, TRANSDUCERS, CALIBRATION, SENSITIVITY, MATHEMATICAL ANALYSIS.)
ASSISTANT SECRETARY OF DEFENSE (RESEARCH AND ENGINEERING), WASHINGTON, D. C.
AD-273 518 62-2-6 DIV. 25

(*SYMPOSIA, *SHOCK, *VIBRATION, *PACKAGING, *TRANSPORTATION, MEASUREMENT, SIMULATION, DESIGN.) (RAILROADS, RAILROAD TRACKS, RAILROAD CARS, CARGO, SHIPPING.) (*MILITARY TRANSPORTATION, CARGO VEHICLES, TERRAIN, ROADS, RAILS.) (PACKAGING, CONTAINERS, STORAGE, MATERIALS, FOAM RUBBER, FOAMS, CELLULOSE, HANDLING, GUIDED MISSILES, NUCLEAR POWER PLANTS, DESIGN, TRAILERS, ELECTRONIC EQUIPMENT.) (AIR TRANSPORTATION, AIR DROP OPERATIONS, AIRBORNE, CONTAINERS.)
ASSISTANT SECRETARY OF DEFENSE, RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 515 62-2-6 DIV. 11

(*SYMPOSIA, *BODY ARMOR, PROTECTIVE CLOTHING.) TEXTILES, LAMINATES, PHYSICAL PROPERTIES, SHOCK RESISTANCE.
OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 876 62-2-6 DIV. 29

***SYNTHESIS**

(*ORGANIC COMPOUNDS, *SEMICONDUCTORS, POLYMERS, *SYNTHESIS, CHEMICAL REACTIONS, *QUINONES, *CYANO RADICALS, PHENYL RADICALS, METHANES, OXIMES, BENZONITRILES, BENZENES, ETHYLENES, HYDROXIDES.) (ELECTRICAL PROPERTIES, ELECTRICAL CONDUCTANCE, PHOTOELECTRIC EFFECT, RADIOFREQUENCY.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 856 62-2-6 DIV. 4

***TABLES**

(*TABLES FOR *OCEANOGRAPHY; ANALYSIS OF PHYSICAL PROPERTIES AND CHEMICAL PROPERTIES OF *OCEANOGRAPHICAL DATA FROM *ARCTIC REGIONS; ICE.) (TEMPERATURE; SALINITY AND DEPTH FINDING BY SAMPLING.) (DENSITY; SEA WATER.) (WEATHER FORECASTING; WIND; CLOUDS; VISIBILITY.)
WASHINGTON U., SEATTLE.
AD-273 525 62-2-6 DIV. 2

HANDBOOKS OF *BLACKBODY RADIATION; *FUNCTIONS; *TABLES.
NAVAL ORDNANCE TEST STATION; CHINA LAKE; CALIF.
AD-273 559 62-2-6 DIV. 25

***TARGETS**

(*TARGETS; *DETECTION; IDENTIFICATION; AIR TO SURFACE.) (*HELICOPTERS; TARGET RECOGNITION; OPTICAL TARGET DESIGNATORS; PILOTS; AVIATION PERSONNEL.)
HUMAN ENGINEERING LABS., ABERDEEN PROVING GROUND, MD.
AD-273 696 2-2-6 DIV. 6

***TELEMETERING DATA**

(RADIOFREQUENCY; *INTERFERENCE IN *RADIATION COUNTERS, RECORDING DEVICES FROM *TELEMETERING TRANSMITTERS; TESTS; MEASUREMENT.) (TELEMETER SYSTEMS; *RADIO EQUIPMENT; TELEMETERING DATA; RADIOLOGICAL CONTAMINATION; ERRORS; RELIABILITY.)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 482 62-2-6 DIV. 20

***TELEMETERING TRANSMITTERS**

(RADIOFREQUENCY; *INTERFERENCE IN *RADIATION COUNTERS, RECORDING DEVICES FROM *TELEMETERING TRANSMITTERS; TESTS; MEASUREMENT.) (TELEMETER SYSTEMS; *RADIO EQUIPMENT; TELEMETERING DATA; RADIOLOGICAL CONTAMINATION; ERRORS; RELIABILITY.)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 482 62-2-6 DIV. 20

***TELEPHONE COMMUNICATION SYSTEMS**

(*MILITARY COMMUNICATIONS; *COMMUNICATION SYSTEMS; DESIGN; *VOICE COMMUNICATION SYSTEMS; *TELEPHONE COMMUNICATION SYSTEMS; FACSIMILE COMMUNICATION SYSTEMS.) (*COMMUNICATION EQUIPMENT; MAINTENANCE; RELIABILITY; FACSIMILE TRANSMISSION.) (CODING; PULSE MODULATION; AUDITORY SIGNALS.) *PANEL BOARDS (ELECTRICITY).
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 683 62-2-6 DIV. 5

***TELEVISION COMMUNICATION SYSTEMS**

(*LUNAR PROBES; MOBILE; COMMUNICATION EQUIPMENT.) (*RADIO COMMUNICATION SYSTEMS; *TELEVISION COMMUNICATION SYSTEMS; DATA TRANSMISSION SYSTEMS; PULSE MODULATION; CODING; MATHEMATICAL ANALYSIS.) (RADIOFREQUENCY POWER OF *RADIO TRANSMITTERS; ANTENNAS FOR RADIO RECEIVERS.) (MOON TO EARTH; COMMUNICATION SYSTEMS.)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 812 62-2-6 DIV. 12

***TELEVISION DISPLAY SYSTEMS**

(*TELEVISION DISPLAY SYSTEMS; *THREE DIMENSIONAL DISPLAY SYSTEMS; FEASIBILITY STUDIES FOR *TRAINING DEVICES.) (TRAINING FROM SIMULATION; DISPLAY SYSTEMS; *TELEVISION EQUIPMENT; CATHODE RAY TUBES; STORAGE TUBES; OPTICAL SYSTEMS.
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
AD-273 486 62-2-6 DIV. 5

***TELEVISION EQUIPMENT**

(*TELEVISION DISPLAY SYSTEMS; *THREE DIMENSIONAL DISPLAY SYSTEMS; FEASIBILITY STUDIES FOR *TRAINING DEVICES.) (TRAINING FROM SIMULATION; DISPLAY SYSTEMS; *TELEVISION EQUIPMENT; CATHODE RAY TUBES; STORAGE TUBES; OPTICAL SYSTEMS.
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
AD-273 486 62-2-6 DIV. 5

***TELEVISION GUIDANCE**

(*ICONOSCOPES; TELEVISION CAMERAS; *CAMERA TUBES; *INFRARED IMAGE TUBES; *INFRARED TELEVISION SYSTEMS; *TELEVISION GUIDANCE; *AERIAL RECONNAISSANCE; AIRBORNE; EFFECTIVENESS; ANALYSIS.) (CAMERA TUBES; OPTICAL EQUIPMENT; INFRARED EQUIPMENT; SENSITIVITY; SIGNAL-TO-NOISE RATIO.) (SURFACE AREA; SURFACE TEMPERATURES; ILLUMINATION; BRIGHTNESS; INTENSITY; BLACKBODY RADIATION; MATHEMATICAL ANALYSIS.)
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
AD-273 814 62-2-6 DIV. 8

***TELLURIDES**

(*SEMICONDUCTORS; INTERMETALLIC COMPOUNDS; *SINGLE CRYSTALS; *CADMIUM COMPOUNDS; *TELLURIDES; PHASE STUDIES; MELTING; GROWTH; ZONE MELTING; TEMPERATURE; ELECTRON OPTICS; REFLECTION; ABSORPTION; SPECTROGRAPHIC ANALYSIS; SOLID STATE PHYSICS.)
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
AD-273 623 62-2-6 DIV. 25

***TEMPERATURE**

(*PLASMA PHYSICS; MEASUREMENT OF *TEMPERATURE.) (BLACKBODY RADIATION; SPECTROGRAPHIC ANALYSIS.)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 590 62-2-6 DIV. 25

***TEMPERATURE COEFFICIENT OF REACTIVITY**

(HELIUM; HYDROGEN; NEON; NITROGEN; CARBON DIOXIDE; PLATINUM; TUNGSTEN; ENERGY; MOTION; *HEAT TRANSFER; *TEMPERATURE COEFFICIENT OF REACTIVITY.) (MOLECULES; *KINETIC THEORY; METALS; SURFACES.)
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
AD-273 498 62-2-6 DIV. 25

***TEMPERATURE CONTROL**

(*SATELLITE VEHICLES; *NAVIGATION.) (SPACE ENVIRONMENTAL CONDITIONS; *THERMAL INSULATION, *TEMPERATURE CONTROL; HEAT TRANSFER; THERMAL CCONDUCTIVITY; RADIATORS, COATINGS; HEAT RESISTANT PAINTS.) (SURFACES; TEMPERATURE.)
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
AD-273 555 2-2-6 DIV. 12

***TENSILE PROPERTIES**

(METALS; *SHEETS; *BERYLLIUM; MANUFACTURING METHODS; PROCESSING.) (TESTS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; ELASTICITY; DEFORMATION; STRESSES.) (ALLOYS; STAINLESS STEEL (PH15-7MO;RH950); TITANIUM ALLOYS (Ti6AL-4V);.)
MARTIN MARIETTA CORP., BALTIMORE, MD.
AD-273 707 2-2-6 DIV. 17

(MATERIALS; *MECHANICAL PROPERTIES; *TENSILE PROPERTIES; PHYSICAL PROPERTIES; TEST METHODS.) (*ADHESIVES; RESIN ADHESIVES, RUBBER ADHESIVES; *LAMINATES; RESINS; PLASTICS; GLASS TEXTILES; *SEALS; *SEALING COMPOUNDS.) (*ALLOYS; *STEEL (4130; 18-7PH; 4340; 300M); *STAINLESS STEEL (AM 350; A286; AM 355; 321; 422; PH 15-7 MO; 17-4 PH); *ALUMINUM ALLOYS (7075-T73; X2219-T81; VANADIUM ALLOYS.) (HONEYCOMB CORES; SANDWICH CONSTRUCTION; BRAZING; SILVER SOLDERS (AMS 4770).) (*NICKEL ALLOYS (INCONEL-X; RENE' 41; M-252; INCONEL 718); CHROMIUM ALLOYS; COBALT ALLOYS; MOLYBDENUM ALLOYS; *TITANIUM ALLOYS.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

***TERRESTRIAL MAGNETISM**

(THEORY OF *PROPAGATION OF *ELECTROMAGNETIC WAVES AROUND *SPHERES; EARTH.) (*TERRESTRIAL MAGNETISM; CONDUCTIVITY; DIELECTRICS; ATTENUATION.) (*WAVE ANALYSIS; POLYNOMIALS; INTEGRAL EQUATIONS; TRANSFORMATIONS (MATHEMATICS).) NUMERICAL ANALYSIS BY COMPUTERS.
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 463 62-2-6 DIV. 25

(*MAGNETOHYDRODYNAMICS; *EXTREMELY LOW FREQUENCY; *ELECTROMAGNETIC WAVES; MAGNETIC FIELDS; OSCILLATIONS; CONDUCTIVITY; WAVES.) (*TERRESTRIAL MAGNETISM; *SOLAR DISTURBANCES; *FLUID FLOW.) (TRANSFORMATIONS (MATHEMATICS); PARTIAL DIFFERENTIAL EQUATIONS; PERTURBATION THEORY.)
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
AD-273 492 62-2-6 DIV. 25

***TEST FACILITIES**

(TESTS OF *ACOUSTIC INSULATION FOR JET FIGHTERS.) (EFFECTIVENESS AS SUPPRESSORS OF *JET ENGINE NOISE; SOUND TRANSMISSION; SOUND PRESSURE.) (ACOUSTIC INSULATION OF *TEST FACILITIES; BUILDINGS.)
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
AD-273 892 62-2-6 DIV. 30

***TEST METHODS**

(SIMULATION OF *SPACE ENVIRONMENTAL CONDITIONS ON THE *MOON; *VACUUM SYSTEMS.) (ANALYSIS; TESTS OF IMPACT SHOCK IN *VOLCANIC DUST AND ROCK.) (FEASIBILITY STUDIES AND *TEST METHODS; EXPERIMENTAL DATA; PHOTOGRAPHIC ANALYSIS.) THESES.
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 604 62-2-6 DIV. 2

***TEST SETS**

(*VOICE COMMUNICATION SYSTEMS; *SPEECH TRANSMISSION; RADIO COMMUNICATION SYSTEMS; RADIO INTERFERENCE; INTERFERENCE; SIGNAL-TO-NOISE RATIO; *SPEECH; INTELLIGIBILITY; *TEST SETS; AUTOMATIC MONITORS; DESIGN.) (RADIO INTERFERENCE ANALYZERS; EFFECTIVENESS; TESTS.)
GEORGIA INST. OF TECH ENGINEERING EXPERIMENT STATION; ATLANTA.
AD-273 898 62-2-6 DIV. 5

***TESTS**

(*TESTS AND DESIGN OF *MASERS BY *TUNED AMPLIFIERS.) (ANALYSIS BY *LOW TEMPERATURE RESEARCH; MATERIALS OF CRYSTALS; *OXIDES; *TITANIUM COMPOUNDS WITH CHROMIUM; THIN FILMS.) (WAVEGUIDES; FERRITES; DIELECTRICS; FERROMAGNETIC MATERIALS.)
AIRBORNE INSTRUMENTS LAB., INC., MINEOLA, N. Y.
AD-273 866 62-2-6 DIV. 25

***THEODOLITES**

(*THEODOLITES; MOTION PICTURE CAMERAS.) (*ANALOG-TO-DIGITAL CONVERTERS; DIGITAL COMPUTERS; DATA PROCESSING SYSTEMS.) (TRACKING TELESCOPES; POSITION FINDING.)
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND; WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 663 62-2-6 DIV. 25

***THERMAL INSULATION**

(*SATELLITE VEHICLES; *NAVIGATION.) (SPACE ENVIRONMENTAL CONDITIONS; *THERMAL INSULATION, *TEMPERATURE CONTROL; HEAT TRANSFER; THERMAL CCONDUCTIVITY; RADIATORS; COATINGS; HEAT RESISTANT PAINTS.) (SURFACES; TEMPERATURE.)
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
AD-273 555 2-2-6 DIV. 12

***THERMAL NEUTRONS**

(*THERMAL NEUTRONS; *FAST NEUTRONS; *DOSIMETERS; RADIOACTIVE FILMS; PHOTOGRAPHIC EMULSIONS; DETECTORS.) (*WATER BOILER REACTORS; GAMMA RAYS; GAMMA EMISSION; SENSITIVITY; PHOTONS.) (CADMIUM; LITHIUM; GOLD; FUELS.) EXPERIMENTAL DATA.
NUCLEAR DEFENSE LAB., ARMY CHEMICAL CENTER, MD.
AD-273 456 62-2-6 DIV. 20

***THERMAL RADIATION**

(MEASUREMENT OF *HEAT TRANSFER BY *THERMAL RADIATION IN HYDROGEN; *HIGH TEMPERATURE RESEARCH.) (BLACKBODY RADIATION; ABSORPTION; *TRANSPORT PROPERTIES; ANALYSIS.) (DIGITAL COMPUTERS; PROGRAMMING FOR DENSITY; ENERGY; TEMPERATURE; PRESSURE.) (TAYLOR'S SERIES; INTEGRALS.)
UNITED AIRCRAFT CORP, EAST HARTFORD, CONN.
AD-273 467 62-2-6 DIV. 25

***THERMIONIC EMISSION**

(*POWER SUPPLIES; *THERMIONIC EMISSION; SEALS; ELECTRIC INSULATION; CERAMIC MATERIALS; REFRACTORY MATERIALS; METALLIC COMPOUNDS; OXIDES; BORON COMPOUNDS; NITRIDES; ZIRCONIUM COMPOUNDS; SILICATES.) (PHYSICAL PROPERTIES; DENSITY; MECHANICAL PROPERTIES; ELECTRICAL PROPERTIES; RESISTANCE; THERMODYNAMICS; NEUTRON CROSS SECTIONS; NEUTRON CAPTURE; THERMAL CONDUCTIVITY; STABILITY.) BIBLIOGRAPHY.
ARMOUR RESEARCH FOUNDATION; CHICAGO, ILL.
AD-273 481 62-2-6 DIV. 7

(*THERMIONIC EMISSION; THERMODYNAMICS; THERMAL CONDUCTIVITY; *WORK FUNCTIONS; ATOMIC ENERGY LEVELS; ELECTRON TRANSITIONS; QUANTUM MECHANICS; MATERIALS; SEMICONDUCTORS; METALLIC COMPOUNDS.) (ALKALINE EARTH COMPOUNDS; OXIDES.) (TRANSITION ELEMENTS; BORIDES; CARBIDES; NITRIDES.) (RARE EARTH COMPOUNDS; BORIDES.) SOLID STATE PHYSICS; THEORY; ELECTRIC POWER PRODUCTION; THERMOELECTRICITY.
ALLIED RESEARCH ASSOCIATES, INC., BOSTON, MASS.
AD-273 533 62-2-6 DIV. 25

(*ELECTRIC POWER PRODUCTION; *POWER SUPPLIES; *THERMOELECTRICITY; *THERMIONIC EMISSION; *FUEL CELLS; GENERATORS; *VOLTAGE REGULATORS; SWITCHING CIRCUITS; CONTROL SYSTEMS; INVERTED RECTIFIERS; TRANSISTORS; RECTIFIERS; STABILITY; DESIGN.) (POWER SUPPLIES; SOURCES; VOLTAGE; IMPEDANCE; ELECTRONIC CIRCUITS; SEMICONDUCTORS; TESTS.)
GENERAL ELECTRIC CO., WEST LYNN, MASS.
AD-273 869 62-2-6 DIV. 7

***THERMODYNAMICS**

(SINTERED; *ZIRCONIUM COMPOUNDS; *DIOXIDES; *CALCIUM COMPOUNDS; *ZIRCONATES;

YTTRIUM COMPOUNDS, OXIDES, CERIUM COMPOUNDS, REFRACTORY MATERIALS, CERAMIC MATERIALS, HIGH TEMPERATURE RESEARCH,) (TEST METHODS, *THERMODYNAMICS, THERMAL STRESSES, THERMAL EXPANSION, THERMAL CONDUCTIVITY, BLACK-BODY RADIATION, SPECIFIC HEAT, MELTING, CRYSTAL STRUCTURE, DENSITY, POROSITY,) TABLES, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES,
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 802 62-2-6 DIV. 14

*THERMOELECTRICITY

(*GENERATORS, *THERMOELECTRICITY, DESIGN,) HEAT TRANSFER, HEAT EXCHANGERS, COOLING, THERMOCOUPLES, THERMAL CONDUCTIVITY, ELECTRICAL PROPERTIES, ELECTRIC POWER PRODUCTION, POWER SUPPLIES, FUEL SYSTEMS, TESTS, TEST METHODS,
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
AD-273 656 2-2-6 DIV. 7

(*ELECTRIC POWER PRODUCTION, *POWER SUPPLIES, *THERMOELECTRICITY, *THERMIONIC EMISSION, *FUEL CELLS, GENERATORS, *VOLTAGE REGULATORS, SWITCHING CIRCUITS, CONTROL SYSTEMS, INVERTED RECTIFIERS, TRANSISTORS, RECTIFIERS, STABILITY, DESIGN,) (POWER SUPPLIES, SOURCES, VOLTAGE, IMPEDANCE, ELECTRONIC CIRCUITS, SEMICONDUCTORS, TESTS,)
GENERAL ELECTRIC CO., *EST LYNN, MASS.
AD-273 869 62-2-6 DIV. 7

*THICKNESS

(ALLOYS, *STEEL (A-286, AM-350, POTOMAC TYPE 422, ALTEMP R-41), *SHEETS FOR AIRFRAMES,) (MANUFACTURING METHODS, PROCESSING, MELTING, HEAT TREATMENT, ROLLING MILLS, *PRECISION FINISHING, WELDING, *THICKNESS GAGES, QUALITY CONTROL,) TABLES,
ALLEGHENY LUDLUM STEEL CORP., BRACKENRIDGE, PA.
AD-273 532 62-2-6 DIV. 26

*THIN FILMS

(*STORAGE TUBES, *DISPLAY SYSTEMS, *THIN FILMS, *DIELECTRIC FILMS, ZINC COMPOUNDS, SULFIDES, *ELECTRON BOMBARDMENT, ION BOMBARDMENT, ELECTRICAL CONDUCTANCE, PROCESSING, HEAT TREATMENT, CRYSTALS, GROWTH,) X-RAY DIFFRACTION ANALYSIS,
HUGHES AIRCRAFT CO., MALIBU, CALIF.
AD-273 628 62-2-6 DIV. 8

(DATA PROCESSING SYSTEMS, DATA STORAGE SYSTEMS, COMPUTER LOGIC, *DIGITAL COMPUTERS, *MEMORY DEVICES, *MAGNETIC CORES, *MAGNETIC TAPE, FERROMAGNETIC MATERIALS,) (MANUFACTURING METHODS, PROCESSING, MAGNETIC TAPES, ELECTRODEPOSITION, METALLIC SMOKE DEPOSITS, *THIN FILMS, GLASS, METALS,)
REMINGTON RAND UNIVAC DIV., SPERRY RAND CORP., ST. PAUL, MINN.
AD-273 749 62-2-6 DIV. 30

*THREE DIMENSIONAL DISPLAY SYSTEMS

(*TELEVISION DISPLAY SYSTEMS, *THREE DIMENSIONAL DISPLAY SYSTEMS, FEASIBILITY STUDIES FOR *TRAINING DEVICES,) (TRAINING FROP SIMULATION, DISPLAY SYSTEMS, *TELEVISION EQUIPMENT, CATHODE RAY TUBES, STORAGE TUBES, OPTICAL SYSTEMS,
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
AD-273 486 62-2-6 DIV. 5

*THRUST AUGMENTOR NOZZLES

(*IONS, *THRUST AUGMENTOR NOZZLES, TESTS, *ELECTRONS,) (ROCKET MOTOR, PRESSURE, TEMPERATURE, MEASUREMENT,) (*SPECTROGRAPHIC ANALYSIS, OPTICS, DETECTION, BLACK-BODY RADIATION,) (*GAS FLOW, *PLASMA PHYSICS,) (NUMERICAL ANALYSIS, INTEGRAL EQUATIONS,)
BENDIX SYSTEMS DIV., BENDIX CORP., ANN ARBOR, MICH.
AD-273 940 62-2-6 DIV. 20

*THUNDERCLOUDS

(*WEATHER FORECASTING OF *THUNDERCLOUDS AND *STORMS BY STATISTICAL ANALYSIS OF MOISTURE, WIND AND PRESSURE OF ATMOSPHERE,)
RAND CORP., SANTA MONICA, CALIF.
AD-273 516 62-2-6 DIV. 2

*TITANIUM

(*LIQUEFIED GASES, *OXYGEN, CHEMICAL REACTIONS WITH *TITANIUM, *COMBUSTION, PRESSURE,) (OXIDATION INHIBITORS, HYDROGEN COMPOUNDS, FLUORIDES GAS OR ARGON AND COATINGS OF PHOSPHATES OR VAPOR PLATING, ALUMINUM,)
LIQUID ROCKET PROPELLANTS, METALS,
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
AD-273 489 62-2-6 DIV. 10

*TITANIUM ALLOYS

(*ROCKET CASES, MATERIALS, *SHEETS, *TITANIUM ALLOYS-BASE, ALUMINUM ALLOYS, CHROMIUM ALLOYS, VANADIUM ALLOYS, *WELDS, *FRACTURE (MECHANICS), HEAT TREATMENT, CRYSTAL STRUCTURE, MICROSTRUCTURE, AGING, HARDNESS, DATA,)
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 711 2-2-6 DIV. 17

(*ALLOYS, *TITANIUM ALLOYS, ALUMINUM ALLOYS, ZIRCONIUM ALLOYS, TIA ALLOYS, SHEETS,) (TESTS, CHEMICAL ANALYSIS, METALLURGICAL ANALYSIS, HIGH TEMPERATURE RESEARCH, MECHANICAL PROPERTIES, CREEP, DEFORMATION, SURFACE PROPERTIES, TENSILE PROPERTIES, ELECTRIC WELDING, RESISTANCE,) TABLES,
NORTH AMERICAN AVIATION, INC., COLUMBUS, OHIO,
AD-273 713 62-2-6 DIV. 17

(MATERIALS, *MECHANICAL PROPERTIES, *TENSILE PROPERTIES, PHYSICAL PROPERTIES, TEST METHODS,) (*ADHESIVES, RESIN ADHESIVES, RUBBER ADHESIVES, *LAMINATES, RESINS, PLASTICS, GLASS TEXTILES, *SEALS, *SEALING COMPOUNDS,) (*ALLOYS, *STEEL (4130, 15-7PH, 4340, 300M), *STAINLESS STEEL (AM 350, A286, AM 355, 321, 422, PH 15-7 MO, 17-4 PH), *ALUMINUM ALLOYS (7075-T73, X2219-T6), VANADIUM ALLOYS,) (HONEYCOMB CORES, SANDWICH CONSTRUCTION, BRAZING, SILVER SOLDERS (AMS 4770),) (*NICKEL ALLOYS (INCONEL-X, RENE' 41, M-252, INCONEL 718), CHROMIUM ALLOYS, COBALT ALLOYS, MOLYBDENUM ALLOYS, *TITANIUM ALLOYS,)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 800 62-2-6 DIV. 17

(SOLID ROCKET PROPELLANTS, *ROCKET MOTORS, *ROCKET CASES, MANUFACTURING METHODS, DRAWING (MACHINE PROCESSING), HEAT TREATMENT, MACHINE TOOLS, DIES,) (METALS, ALLOYS, *STEEL, *TITANIUM ALLOYS, NICKEL ALLOYS, PROCESSING, HARDENING, MICROSTRUCTURE,)
LYCA INC., DETROIT, MICH.
AD-273 826 62-2-6 DIV. 27

*TITANIUM COMPOUNDS

(*TESTS AND DESIGN OF *MASERS BY *TUNED AMPLIFIERS,) (ANALYSIS BY *LOW TEMPERATURE RESEARCH, MATERIALS OF CRYSTALS, *OXIDES, *TITANIUM COMPOUNDS WITH CHROMIUM, THIN FILMS,) (WAVEGUIDES, FERRITES, DIELECTRICS, FERROMAGNETIC MATERIALS,)
AIRBORNE INSTRUMENTS LAB., INC., MINEOLA, N. Y.
AD-273 866 62-2-6 DIV. 25

*TOOL STEEL

(MATERIALS, *PHYSICAL PROPERTIES, THERMODYNAMICS, CORROSION, MECHANICAL PROPERTIES, TEST METHODS,) (*APLATION, *COATINGS, ELECTRIC INSULATION, *GLASS TEXTILES, GRAPHITE, LAMINATES, ENCAPSULATION, EMBEDDING SUBSTANCES, *ZIRCONIUM COMPOUNDS, DIOXIDES,) (*STAINLESS STEEL (PH15-7MO), HONEYCOMB CORES, SANDWICH PANELS,) (*TOOL STEEL (HSS PUNCH AND DIE, OLYMPIC FN DIE, SELECT B DIE, JET FORGE TOOL, VASCO 7132 TOOL, CK SPECIAL TOOL), DIES,)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 801 62-2-6 DIV. 14

(*TOOL STEEL, SHEETS, METAL PLATES, ARC WELDING, *WELDING, HEAT TREATMENT, HARDENING, THERMAL STRESSES, FRACTURE (MECHANICS), TENSILE PROPERTIES, STRESSES, PRESSURE VESSELS,) TESTS, WELDS, MICROSTRUCTURE, IMPACT SHOCK, AIRCRAFT, GUIDED MISSILES, ROCKET CASES,
ELECTRIC BOAT DIV., GENERAL DYNAMICS CORP., GROTON, CONN.
AD-273 867 62-2-6 DIV. 17

*TORPEDOES

(*BIBLIOGRAPHY, *ANTISUBMARINE WARFARE, *SUBMARINES, *TORPEDOES, *OCEANOGRAPHY,) (UNDERSEA WARFARE, CONTROL SYSTEMS, NUCLEAR PROPULSION, SUBMARINE PERISCOPES, SUBMARINE NOISE,)
AUTONETICS, DOWNEY, CALIF.
AD-273 860 62-2-6 DIV. 31

*TOXICITY

(*PENTABORANES, *TOXICITY, RESPIRATION, DOSAGE, LABORATORY ANIMALS, SURVIVAL,)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS., ARMY CHEMICAL CENTER, MD.
AD-273 484 62-2-6 DIV. 10

(*OXYGEN CONSUMPTION, DOSAGE, TEMPERATURE, PRESSURE, SURVIVAL, LABORATORY ANIMALS,) (*OXYGEN, *TOXICITY, PATHOLOGY, RESPIRATORY SYSTEM,)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS., ARMY CHEMICAL CENTER, MD.
AD-273 485 62-2-6 DIV. 16

(*METHYL HYDRAZINES, RESPIRATION, DOSAGE, LABORATORY ANIMALS, SURVIVAL,) (*TOXICITY, STRESS (PHYSIOLOGY), PATHOLOGY, NERVOUS SYSTEM,)
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS., ARMY CHEMICAL CENTER, MD.
AD-273 490 62-2-6 DIV. 10

*TRACKING

(ASTRONOMY, *SUN, *TRACKING BY *COMMUNICATION SYSTEMS, INTERFEROMETERS, *ELECTRICAL NETWORKS, ANTENNAS,) (SOLAR DISTURBANCES, SOLAR FLARES, SOLAR CORONA, NOISE (RADIO),) (INSTRUMENTATION, PREAMPLIFIERS, DETECTORS, BAND-PASS FILTERS, RECORDING DEVICES,)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 687 62-2-6 DIV. 2

(*SATELLITE VEHICLES, *GLIDEC MISSILES, SURFACE TO SURFACE, RADAR TRACKING, RADIO INTERFEROMETERS, *TRACKING,) *PLASMA PHYSICS, *ELECTROMAGNETIC FIELDS, WAVE TRANSMISSION, ELECTROMAGNETIC WAVES, MAGNETOHYDRODYNAMICS, *IONOSPHERIC DISTURBANCES, IONS, IONOSPHERE, UPPER ATMOSPHERE, *RADIO ASTRONOMY, RADIO WAVES, EXTRATERRESTRIAL RADIO WAVES,)
ANTENNA RADIATION PATTERNS, USSR,
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 937 62-2-6 DIV. 12

*TRAFFIC

(OPERATIONS RESEARCH, *SCHEDULING, *TRAFFIC,) STATISTICAL ANALYSIS, APPLIED MATHEMATICS AND STATISTICS LABS.,
STANFORD U., CALIF.
AD-273 693 62-2-6 DIV. 26

*TRAILERS

(ROADS, TRANSPORTATION, TESTS OF *TRAILERS FOR *ARTILLERY ROCKETS FOR THE DETERMINATION OF STRUCTURES, STRESSES,) (STRAIN GAGES, INSTRUMENTATION,)
ORDNANCE MISSION, WHITE SANDS MISSILE RANGE, N. MEX.
AD-273 712 2-2-6 DIV. 11

*TRAINING DEVICES

(*TELEVISION DISPLAY SYSTEMS, *THREE DIMENSIONAL DISPLAY SYSTEMS, FEASIBILITY STUDIES FOR *TRAINING DEVICES,) (TRAINING FROP SIMULATION, DISPLAY SYSTEMS, *TELEVISION EQUIPMENT, CATHODE RAY TUBES, STORAGE TUBES, OPTICAL SYSTEMS,
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
AD-273 486 62-2-6 DIV. 5

*TRANSDUCERS

(SONAR, *ANTENNA RADIATION PATTERNS, VERY LOW FREQUENCY, *TRANSDUCERS, CALIBRATION, TESTS, MEASUREMENT IN WATER TUNNELS, TEST FACILITIES,) (ANTISUBMARINE WARFARE, *SONAR EQUIPMENT, SCANNING SONAR, DIRECTION FINDING, PRESSURE, PHASE MEASUREMENT, DETERMINATION,) *ELECTROACOUSTIC TRANSDUCERS,
DEFENSE RESEARCH LAB., U. OF TEXAS, AUSTIN.
AD-273 922 62-2-6 DIV. 6

*TRANSISTORS

(*TRANSISTORS, GERMANIUM, SILICON, SEMICONDUCTORS, *PACKAGING, *SUBMINIATURE ELECTRONIC EQUIPMENT, PRODUCTION, *MANUFACTURING METHODS, DESIGN, TESTS,)
SYLVANIA ELECTRIC PRODUCTS, INC., *BURN, MASS.
AD-273 848 62-2-6 DIV. 8

(MEASUREMENT OF *NEUTRON FLUX DENSITY WITH *TRANSISTORS OF SILICON,) (RADIATION COUNTERS, *NEUTRON CAPTURE GAMMA RAYS, THERMAL NEUTRONS, FAST NEUTRONS,) (TRANSISTORS, IONIZATION, RADIATION EFFECTS,) (NEUTRON SCATTERING, DOSIMETERS, RADIATION COUNTERS,)
HUGHES AIRCRAFT CO., CULVER CITY, CALIF.
AD-273 861 62-2-6 DIV. 20

*TRANSMISSION LINES

(*MICROWAVE EQUIPMENT, *TRANSMISSION LINES, *WAVEGUIDES, *WAVE TRANSMISSION, ELECTRIC FIELDS, MAGNETIC FIELDS, BESSEL FUNCTIONS, MATHEMATICAL ANALYSIS, OPSIGN,)
BOEING CO., RENTON, WASH.
AD-273 615 62-2-6 DIV. 8

(*PHASE SHIFTERS, TRIODES, DIGITAL SYSTEMS, *SWITCHING CIRCUITS, PHASE MEASUREMENT, L BAND, ULTRA HIGH FREQUENCY, ELECTRONIC SWITCHES, DESIGN,) (RADAR ANTENNAS, *TRANSMISSION LINES, ELECTRONIC CIRCUITS, NARROWBAND, RADAR EQUIPMENT, DESIGN,)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 631 62-2-6 DIV. 8

(*WAVE TRANSMISSION ALONG *TRANSMISSION LINES, *ANTENNAS,) (GEOMETRY, FUNCTIONS, POLYNOMIALS, TAYLOR'S SERIES, FOURIER ANALYSIS,) (ELECTRICAL PROPERTIES OF TRANSMISSION LINES, IMPEDANCE,)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 761 62-2-6 DIV. 25

***TRANSONIC WIND TUNNELS**

(*TRANSONIC WIND TUNNELS; *SUPERSONIC WIND TUNNELS; WIND TUNNELS; WIND TUNNEL MODELS; INSTRUMENTATION; OSCILLATION;) (AERODYNAMIC CONFIGURATIONS; STABILITY (LONGITUDINAL); STABILITY (LATERAL); DAMPING; STABILITY; TEST METHODS;) (*VIBRATION MECHANISMS BY HYDRAULIC SYSTEMS; DESIGN; TESTS;) (WING-BODY CONFIGURATIONS; SWEPT-BACK WINGS; TRANSONICS; AERODYNAMICS; MODEL TESTS;) (BALANCES; EXPERIMENTAL DATA; MATHEMATICAL ANALYSIS; ERRORS;)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 369 62-2-6 DIV. 30

***TRANSPARENT PANELS**

(*AIRCRAFT CANOPIES; *TRANSPARENT PANELS; PLASTICS; *LAMINATES; MATERIALS; HEAT RESISTANT POLYMERS; EPOXY RESINS; GLASS; THERMAL INSULATION; CASTING; FEASIBILITY STUDIES; TESTS;) (SUPERSONIC PLANES; JET PLANES; JET FIGHTERS; AIRCRAFT CANOPIES; WINDSHIELDS; PRODUCTION; DESIGN; THERMAL STRESSES; SHOCK RESISTANCE;) TEST EQUIPMENT, TEST METHODS, GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
AD-273 897 62-2-6 DIV. 1

***TRANSPORT PLANES**

(*GROUND-CONTROLLED APPROACH RADAR; *AIRPORT RADAR SYSTEMS; AUTOMATIC PILOTS; *TRANSPORT PLANES; *RADAR NAVIGATION; AUTOMATIC; RELIABILITY; FLIGHT TESTING;) (RADAR SIGNALS; DATA PROCESSING SYSTEMS; DATA TRANSMISSION SYSTEMS; *RADIO NAVIGATION; TESTS;) (*ALL-WEATHER AVIATION; LANDING; INSTRUMENT LANDING; RADAR EQUIPMENT; RADIO EQUIPMENT;)
BELL AEROSYSTEMS CO., BUFFALO, N. Y.
AD-273 538 62-2-6 DIV. 19

***TRANSPORT PROPERTIES**

(MEASUREMENT OF *HEAT TRANSFER BY *THERMAL RADIATION IN HYDROGEN; *HIGH TEMPERATURE RESEARCH;) (BLACKBODY RADIATION; ABSORPTION; *TRANSPORT PROPERTIES; ANALYSIS;) (DIGITAL COMPUTERS; PROGRAMMING FOR DENSITY, ENERGY, TEMPERATURE, PRESSURE;) (TAYLOR'S SERIES, INTEGRALS;)
UNITED AIRCRAFT CORP, EAST HARTFORD, CONN.
AD-273 467 62-2-6 DIV. 25

(*LOW TEMPERATURE RESEARCH ON *PLASMA JETS;) (RESEARCH PROGRAM ADMINISTRATION; *ABSTRACTING OF SCIENTIFIC RESEARCH RELATED TO EXPERIMENTAL DATA AND THEORY OF ENERGY; *TRANSPORT PROPERTIES AND IONIZATION OF *GAS FLOW;) BIBLIOGRAPHY,
AEROCHEM RESEARCH LABS., INC., PRINCETON, N. J.
AD-273 889 62-2-6 DIV. 25

/TRANSPORTATION

(*SYMPOSIA; *SHOCK, *VIBRATION; *PACKAGING; *TRANSPORTATION; MEASUREMENT, SIMULATION; DESIGN;) (RAILROADS, RAILROAD TRACKS; RAILROAD CARS; CARGO, SHIPPING;) (*MILITARY TRANSPORTATION; CARGO VEHICLES; TERRAIN; ROADS; SAILS;) (PACKAGING; CONTAINERS; STORAGE; MATERIALS; FOAM RUBBER, FOAMS; CCELLULOSE; HANDLING; GUIDED MISSILES; NUCLEAR POWER PLANTS; DESIGN; TRAILERS; ELECTRONIC EQUIPMENT;) (AIR TRANSPORTATION; AIR DROP OPERATIONS, AIRBORNE, CONTAINERS;)
ASSISTANT SECRETARYY OF DEFENSE, RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 919 62-2-6 DIV. 11

***TUNED AMPLIFIERS**

(*TESTS AND DESIGN OF *MASERS BY *TUNED AMPLIFIERS;) (ANALYSIS BY *LOW TEMPERATURE RESEARCH; MATERIALS OF CRYSTALS; *OXIDES; *TITANIUM COMPOUNDS WITH CHROMIUM; THIN FILMS;) (WAVEGUIDES; FERRITES; DIELECTRICS; FERROMAGNETIC MATERIALS;)
AIRBORNE INSTRUMENTS LAB., INC., MINEOLA, N. Y.
AD-273 866 62-2-6 DIV. 25

***TUNGSTEN**

(*ELECTROPLATING; *TUNGSTEN; ORGANIC COMPOUNDS; ELECTROLYTES; ACIDS; SOLUTIONS;)
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 859 62-2-6 DIV. 17

***TURBOSUPERCHARGER BLADES**

*REMOTE CONTROL SYSTEMS; *WEIGHTLESSNESS; SIMULATION; HUMAN ENGINEERING; HANDLING; SENSITIVITY; CONTROL; EFFECTIVENESS; BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 491 62-2-6 DIV. 16

***TURBULENT FLOW**

(*FUEL SPRAYS INTO *TURBULENT FLOW; *COMBUSTION OF BENZENES; JET MIXING FLOW; SPECTROGRAPHIC ANALYSIS; CHEMICAL ANALYSIS; MEASUREMENT,)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 886 62-2-6 DIV. 10

***TWILIGHT**

(MEASUREMENT OF *TWILIGHT WITH *PHOTOMETERS;) (MEASUREMENT OF DENSITY OF PARTICLES IN ATMOSPHERE AT TWILIGHT;) (ATMOSPHERE; OPTICS;)
BLUE HILL METEOROLOGICAL OBSERVATORY, HARVARD U., MILTON, MASS.
AD-273 897 62-2-6 DIV. 2

***ULTRAVIOLET RADIATION**

(RADIATION EFFECTS OF *ULTRAVIOLET RADIATION IN A VACUUM ON *PLASTIC PAINTS AND *PLASTIC COATINGS CONTAINING ZINC COMPOUNDS; SULFIDES; ALUMINUM; TITANIUM COMPOUNDS; DIOXIDES, LEAD COMPOUNDS; CARBONATES; SILICONE RESINS; ACRYLIC RESINS;) (*ORGANIC COATINGS FOR CONTROL OF TEMPERATURE WITHIN SPACESHIPS;) (REFLECTION OF ULTRAVIOLET RADIATION;) (OPTICS; ORGANIC COATINGS;)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 716 2-2-6 DIV. 14

***UNDERGROUND EXPLOSIONS**

(*PHOTOGRAPHIC RECORDING SYSTEMS FOR PHOTOGRAPHIC ANALYSIS OF MOTION OF EARTH SURFACES AFTER *UNDERGROUND EXPLOSIONS; *NUCLEAR EXPLOSIONS, TESTS; EFFECTIVENESS; DATA; TABLES;)
EDGERTON, GERMESHAUSEN AND GRIER, INC., BOSTON, MASS.
AD-273 760 62-2-6 DIV. 24

(FEASIBILITY STUDIES FOR THE DETECTION AND IDENTIFICATION OF *UNDERGROUND EXPLOSIONS;) (*NUCLEAR EXPLOSIONS; SEISMOLOGICAL STATIONS; LOW FREQUENCY; *ELECTROMAGNETIC WAVES; SEISMIC WAVES;) (DETECTION OF ATOMIC BOMB EXPLOSIONS;)
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON,
AD-273 823 62-2-6 DIV. 20

***UNDERWATER SOUND**

(*DETECTION OF *SONAR SIGNALS; *UNDERWATER SOUND SIGNALS; *UNDERWATER SOUND IN PRESENCE OF NOISE USING CORRELATION TECHNIQUES;) SIGNAL-TO-NOISE RATIO; ACOUSTICS; ACOUSTIC DETECTORS; FOURIER ANALYSIS; INTEGRAL TRANSFORMS,
LITTON SYSTEMS, INC., *ALTHAM, MASS.
AD-273 639 62-2-6 DIV. 6

***UNDERWATER SOUND SIGNAL**

(*DETECTION OF *SONAR SIGNALS; *UNDERWATER SOUND SIGNALS; *UNDERWATER SOUND IN PRESENCE OF NOISE USING CORRELATION TECHNIQUES;) SIGNAL-TO-NOISE RATIO; ACOUSTICS; ACOUSTIC DETECTORS; FOURIER ANALYSIS; INTEGRAL TRANSFORMS,
LITTON SYSTEMS, INC., *ALTHAM, MASS.
AD-273 639 62-2-6 DIV. 6

***UPPER ATMOSPHERE**

(SATELLITE VEHICLES; SOUNDING ROCKETS; HIGH ALTITUDE; METEOROLOGICAL BALLOONS; LUNAR PROBES; *GEOPHYSICAL EXPLORATIONS OF *UPPER ATMOSPHERE AND *SPACE ENVIRONMENTAL CONDITIONS;) (INSTRUMENTATION; TESTS;) (DENSITY; PRESSURE; TEMPERATURE; ULTRAVIOLET RADIATION; ELECTROMAGNETIC PROPERTIES; IONS; ELECTRONS; PLASMA PHYSICS; COSMIC RAYS; GAMMA RAYS; NOISE (RADIO); RADIOMETERS; GEODESICS, METEORITES; MOON; SURFACE PROPERTIES; METEOROLOGY; ATMOSPHERE MODELS;)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 758 62-2-6 DIV. 2

(*SPECTROGRAPHIC ANALYSIS; MOLECULAR SPECTROSCOPY; RARE GASES AND ELEMENTS;) (SPECTROGRAPHIC DATA; RECORDING DEVICES; *INTERFEROMETERS; TEMPERATURES; MEASUREMENT;) (*SODIUM AND *CESIUM; *CLOUDS IN THE *UPPER ATMOSPHERE;)
GEORGIA U., ATHENS.
AD-273 763 62-2-6 DIV. 25

(USSR; TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH;) (*SATELLITE VEHICLE TRAJECTORIES; ORBITAL FLIGHT PATHS; LIFE EXPECTANCY; SPACE FLIGHT TO *MOON; MARS; VENUS; SUN;) (SPACESHIPS; DECELERATION; *RE-ENTRY AERODYNAMICS;) (*UPPER ATMOSPHERE; GEOPHYSICS; *IONOSPHERE;) (PHOTOGRAPHY OF MOON; VAN ALLEN RADIATION BELT;) (BIOLOGY; CONTROLLED ATMOSPHERES; *CLOSED-CYCLE ECOLOGICAL SYSTEMS; DOGS; MANNED; PILOTS; TRAINING; AVIATION SAFETY; GLOBAL FLIGHT;)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***URANIUM**

(*PARAMAGNETIC RESONANCE OF RARE EARTHS; IONS IN CRYSTAL STRUCTURE OF *NEODYMIUM AND *URANIUM; ISOTOPES IN *FLUORSPAR;) (*HYPERFINE STRUCTURE; ATOMIC SPECTRUM; MOLECULAR ROTATION;) (THERMAL DIFFUSION; TRANSPORT PROPERTIES;)
WEBREW U. (ISRAEL).
AD-273 497 62-2-6 DIV. 25

***URANIUM COMPOUNDS**

(*URANIUM COMPOUNDS; OXIDES; OXIDATION-REDUCTION REACTIONS; DECOMPOSITION; *PHASE TRANSITIONS; PHASE STUDIES; X-RAY DIFFRACTION ANALYSIS; REACTION KINETICS;)
USSR,
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 881 62-2-6 DIV. 4

***URETHANES**

(*FOAMS; *EXPANDED PLASTICS; POLYMERS; *URETHANES; MANUFACTURING METHODS; POWDERS; FREEZING; LOW PRESSURE RESEARCH; LOW TEMPERATURE RESEARCH;) (SATELLITE VEHICLES; SPACESHIPS; MATERIALS;) CYANATES; HALOCARBONS; WATER,
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 876 62-2-6 DIV. 14

***USSR**

(USSR; TRANSLATIONS ON *SATELLITE VEHICLE RESEARCH;) (*SATELLITE VEHICLE TRAJECTORIES; ORBITAL FLIGHT PATHS; LIFE EXPECTANCY; SPACE FLIGHT TO *MOON; MARS; VENUS; SUN;) (SPACESHIPS; DECELERATION; *RE-ENTRY AERODYNAMICS;) (*UPPER ATMOSPHERE; GEOPHYSICS; *IONOSPHERE;) (PHOTOGRAPHY OF MOON; VAN ALLEN RADIATION BELT;) (BIOLOGY; CONTROLLED ATMOSPHERES; *CLOSED-CYCLE ECOLOGICAL SYSTEMS; DOGS; MANNED; PILOTS; TRAINING; AVIATION SAFETY; GLOBAL FLIGHT;)
FOREIGN TECH. DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 888 62-2-6 DIV. 12

***VACUUM SYSTEMS**

(SIMULATION OF *SPACE ENVIRONMENTAL CONDITIONS ON THE *MOON; *VACUUM SYSTEMS;) (ANALYSIS; TESTS OF IMPACT SHOCK IN *VOLCANIC DUST AND ROCK;) (FEASIBILITY STUDIES AND *TEST METHODS; EXPERIMENTAL DATA; PHOTOGRAPHIC ANALYSIS;) THESES,
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 604 62-2-6 DIV. 2

***VEHICLE WHEELS**

(TERRAIN; *ROADS; *VEHICLES; MOTION; SIMULATION ON *DIGITAL COMPUTERS;) *VEHICLE WHEELS; *PROGRAMMING, COMPUTERS, ORDNANCE TANK-AUTOMOTIVE COMMAND, DETROIT, MICH.
AD-273 487 62-2-6 DIV. 11

***VEHICLES**

(TERRAIN; *ROADS; *VEHICLES; MOTION; SIMULATION ON *DIGITAL COMPUTERS;) *VEHICLE WHEELS; *PROGRAMMING, COMPUTERS, ORDNANCE TANK-AUTOMOTIVE COMMAND, DETROIT, MICH.
AD-273 487 62-2-6 DIV. 11

***VENUS**

(*VENUS; TEMPERATURE; ROTATION; MEASUREMENT; EXTRATERRESTRIAL RADIO WAVES;)
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
AD-273 808 62-2-6 DIV. 2

***VERY LOW FREQUENCY**

(WAVE TRANSMISSION OF *VERY LOW FREQUENCY; ENERGY BETWEEN EARTH AND *IONOSPHERE; *ATMOSPHERICS;) (*RADIO RANGES AND *AZIMUTH OF RADIOFREQUENCY OSCILLATIONS; RADIOFREQUENCY SPECTRUM ANALYZERS;) (WAVEGUIDES; ANTENNAS; RADIO RECEIVERS; OSCILLOSCOPES; DELAY LINES, RADIOFREQUENCY AMPLIFIERS;) (ERRORS; MATHEMATICAL PREDICTION;)
ELECTRONIC DEFENSE LABS., MOUNTAIN VIEW, CALIF.
AD-273 784 62-2-6 DIV. 25

***VIBRATION**

(*SYMPOSIA; *BIBLIOGRAPHY; *SHOCK; *VIBRATION; *ACOUSTIC IMPEDANCE;) (VIBRATION ISOLATORS; MECHANICAL PROPERTIES; RESISTANCE TO MOTION; DYNAMICS; DAMPING; EFFECTIVENESS;) (ACOUSTIC IMPEDANCE; MEASUREMENT; INSTRUMENTATION; TRANSDUCERS; CALIBRATION; SENSITIVITY; *MATHEMATICAL ANALYSIS;)
ASSISTANT SECRETARY OF DEFENSE (RESEARCH AND ENGINEERING), WASHINGTON, D. C.
AD-273 514 62-2-6 DIV. 25

(*SYMPOSIA; *SHOCK; *VIBRATION; *PACKAGING; *TRANSPORTATION; MEASUREMENT; SIMULATION; DESIGN.) (RAILROADS; RAILROAD TRACKS; RAILROAD CARS; CARGO; SHIPPING.) (*MILITARY TRANSPORTATION; CARGO VEHICLES; TERRAIN; ROADS; SAILS.) (PACKAGING; CONTAINERS; STORAGE; MATERIALS; FOAM RUBBER; FOAMS; CELLULOSE; HANDLING; GUIDED MISSILES; NUCLEAR POWER PLANTS; DESIGN; TRAILERS; ELECTRONIC EQUIPMENT.) (AIR TRANSPORTATION; AIR DROP OPERATIONS; AIRBORNE; CONTAINERS.)
ASSISTANT SECRETARY OF DEFENSE, RESEARCH AND ENGINEERING, WASHINGTON, D. C.
AD-273 515 62-2-6 DIV. 11

(*VIBRATIONS; RESONANCE; DEFORMATION OF *ROTATING STRUCTURES.) (EQUATION OF MOTION; DIFFERENTIAL EQUATIONS.) STATICS.
AEROSPACE CORP., LOS ANGELES, CALIF.
AD-273 593 62-2-6 DIV. 25

***VIBRATION MECHANISMS**

(*TRANSONIC WIND TUNNELS; *SUPERSONIC WIND TUNNELS; WIND TUNNEL MODELS; INSTRUMENTATION; OSCILLATION.) (AERODYNAMIC CONFIGURATIONS; STABILITY (LONGITUDINAL); STABILITY (LATERAL); DAMPING; STABILITY, TEST METHODS.) (*VIBRATION MECHANISMS BY HYDRAULIC SYSTEMS; DESIGN; TESTS.) (WING-BODY CONFIGURATIONS; SWEPT-BACK WINGS; TRANSONICS; AERODYNAMICS; MODEL TESTS.) (BALANCES; EXPERIMENTAL DATA; MATHEMATICAL ANALYSIS; ERRORS.)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 569 62-2-6 DIV. 30

***VIDEO NETWORKS**

(*VIDEO NETWORKS, DESIGN OF *OPTICAL EQUIPMENT; PHOTOELECTRIC CELLS; PHOTOGRAPHIC FILM; OPTICAL FILTERS; FLASH LAMPS.) (*MATHEMATICAL LOGIC; SEQUENCES; ERRORS; ANALYSIS.)
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
AD-273 536 62-2-6 DIV. 25

***VISCOSITY**

(*ALLOYS; *METALS; PHASE STUDIES, LIQUIDS; *VISCOSITY, MEASUREMENT; THEORY; CRYSTALLIZATION; IMPURITIES.) (DATA; STEEL; CAST IRON; IRON ALLOYS; CHROMIUM ALLOYS; CARBON ALLOYS; LEAD; TIN; BISMUTH; ALUMINUM; TIN ALLOYS; LEAD ALLOYS; BISMUTH ALLOYS; ZINC; CADMIUM.) USSR.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
AD-273 563 62-2-6 DIV. 17

(*POLYMERS; BUTENES; STYRENES; ETHYLENES; SULFIDES; PROPENES; FURAN; BUTADIENES; RUBBER; ACRYLIC RESINS.) (DEFORMATION; *VISCOSITY, *ELASTICITY; STRESSES; RELAXATION TIME; TEMPERATURE.) TABLES.
FRICK CHEMICAL LAB., PRINCETON U., N. J.
AD-273 573 62-2-6 DIV. 14

***VOCABULARY**

(*ENGLISH LANGUAGE; *VOCABULARY, STATISTICAL ANALYSIS; DIGITAL COMPUTERS, PROGRAMMING.) MACHINE TRANSLATION.
INDIANA U., BLOOMINGTON.
AD-273 900 62-2-6 DIV. 32

***VOICE COMMUNICATION SYSTEMS**

(*MILITARY COMMUNICATIONS; *COMMUNICATION SYSTEMS, DESIGN; *VOICE COMMUNICATION SYSTEMS; *TELEPHONE COMMUNICATION SYSTEMS; FACSIMILE COMMUNICATION SYSTEMS.) (*COMMUNICATION EQUIPMENT; MAINTENANCE; RELIABILITY; FACSIMILE TRANSMISSION.) (CODING; PULSE MODULATION; AUDITORY SIGNALS.) *PANEL BOARDS (ELECTRICITY).
BELL TELEPHONE LABS., INC., WHIPPANY, N. J.
AD-273 683 62-2-6 DIV. 5

(*AIR FORCE COMMUNICATIONS; *RADIO RELAY STATIONS; *RADIO RELAY SYSTEMS; *SATELLITE VEHICLES; *RADIO COMMUNICATION SYSTEMS; *DATA TRANSMISSION SYSTEMS; FACSIMILE COMMUNICATION SYSTEMS; *VOICE COMMUNICATION SYSTEMS; RADIO RECEIVERS; TELETYPE SYSTEMS.) (COMMUNICATION SYSTEMS; *DIGITAL SYSTEMS; ANALOG TO DIGITAL CONVERTERS; DATA STORAGE SYSTEMS; DATA PROCESSING SYSTEMS.) RADIO SIGNALS; REFLECTIONS.
ITT LABS., FEDERAL LABS., NUTLEY, N. J.
AD-273 870 62-2-6 DIV. 5

(*VOICE COMMUNICATION SYSTEMS; *SPEECH TRANSMISSION; RADIO COMMUNICATION SYSTEMS; RADIO INTERFERENCE; INTERFERENCE; SIGNAL-TO-NOISE RATIO; *SPEECH; INTELLIGIBILITY; *TEST SETS; AUTOMATIC; MONITORS; DESIGN.) (RADIO INTERFERENCE ANALYZERS; EFFECTIVENESS; TESTS.)
GEORGIA INST. OF TECH ENGINEERING EXPERIMENT STATION, ATLANTA.
AD-273 898 62-2-6 DIV. 5

***VOLCANIC DUST**

(SIMULATION OF *SPACE ENVIRONMENTAL CONDITIONS ON THE *MOON; *VACUUM SYSTEMS.) (ANALYSIS; TESTS OF IMPACT SHOCK IN *VOLCANIC DUST AND ROCK.) (FEASIBILITY STUDIES AND *TEST METHODS; EXPERIMENTAL DATA; PHOTOGRAPHIC ANALYSIS.) THESES.
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
AD-273 604 62-2-6 DIV. 2

***VOLTAGE REGULATORS**

(*ELECTRIC POWER PRODUCTION; *POWER SUPPLIES; *THERMOELECTRICITY; *THERMIONIC EMISSION; *FUEL CELLS; GENERATORS; *VOLTAGE REGULATORS; SWITCHING CIRCUITS; CONTROL SYSTEMS; INVERTED RECTIFIERS; TRANSISTORS, RECTIFIERS; STABILITY; DESIGN.) (POWER SUPPLIES; SOURCES; VOLTAGE; IMPEDANCE; ELECTRONIC CIRCUITS; SEMICONDUCTORS; TESTS.)
GENERAL ELECTRIC CO., WEST LYNN, MASS.
AD-273 869 62-2-6 DIV. 9

***VULCANIZATES**

(*VULCANIZATES; ADDITIVES; *ELASTOMERS; *RADIOACTIVATION ANALYSIS; *RUBBER; *RADIATION EFFECTS; GAMMA EMISSION.)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 636 2-2-6 DIV. 20

***WAKE**

(MICROWAVES; SCATTERING; *WAKES; HYPERVELOCITY PROJECTILES.) (BOUNDARY LAYER; TURBULENCE.) (TURBULENT FLOW; LAMINAR BOUNDARY LAYER.
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
AD-273 817 62-2-6 DIV. 9

***WATER BOILER REACTORS**

(*THERMAL NEUTRONS; *FAST NEUTRONS; *DOSIMETERS; RADIOACTIVE FILMS; PHOTOGRAPHIC EMULSIONS; DETECTORS.) (*WATER BOILER REACTORS; GAMMA RAYS; GAMMA EMISSION; SENSITIVITY; PHOTONS.) (CADMIUM; LITHIUM; GOLD; FUELS.) EXPERIMENTAL DATA.
NUCLEAR DEFENSE LAB., ARMY CHEMICAL CENTER, MD.
AD-273 456 62-2-6 DIV. 20

***WAVE ANALYSIS**

(THEORY OF *PROPAGATION OF *ELECTROMAGNETIC WAVES AROUND *SPHERES; EARTH.) (*TERRESTRIAL MAGNETISM; CONDUCTIVITY; DIELECTRICS; ATTENUATION.) (*WAVE ANALYSIS; POLYNOMIALS; INTEGRAL EQUATIONS; TRANSFORMATIONS (MATHEMATICS).) NUMERICAL ANALYSIS BY COMPUTERS.
NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
AD-273 463 62-2-6 DIV. 25

***WAVE TRANSMISSION**

(RE-ENTRY VEHICLES; *OPTICAL TRACKING; *INFRARED TRACKING; SHIPBORNE.) (*ATMOSPHERE; SKY BRIGHTNESS; SOLAR ENERGY; BLACKBODY RADIATION; DENSITY; ABSORPTION; SCATTERING; *ATTENUATION; *WAVE TRANSMISSION; MEASUREMENT; OPTICAL ANALYSIS.) (ATMOSPHERE MODELS; INSTRUMENTATION.) *GUIDED MISSILE TRACKING SYSTEMS.
BARNES ENGINEERING CO., STAMFORD, CONN.
AD-273 612 62-2-6 DIV. 6

***WAVEGUIDES**

(*WAVEGUIDES; *ANTENNAS; ANTENNA RADIATION PATTERNS; TRANSMISSION LINES; EXCITATION.)
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
AD-273 598 62-2-6 DIV. 8

***WEATHER FORECASTING**

(*WEATHER FORECASTING OF *THUNDERCLOUDS AND *STORMS BY STATISTICAL ANALYSIS OF MOISTURE, WIND AND PRESSURE OF ATMOSPHERE.)
RAND CORP., SANTA MONICA, CALIF.
AD-273 516 62-2-6 DIV. 2

***WEIGHTLESSNESS**

(PHYSICAL PROPERTIES OF *LIQUEFIED GASES DURING *WEIGHTLESSNESS; ATMOSPHERE ENTRY OF GUIDED MISSILE NOSES; RE-ENTRY VEHICLE.) (TEST EQUIPMENT; RECOVERY.)
SPACE TECHNOLOGY LABS., INC., REDONDO BEACH, CALIF.
AD-273 652 62-2-6 DIV. 25

***WELDING**

(*ELECTRONIC EQUIPMENT; AIRCRAFT EQUIPMENT; ELECTRIC CONNECTORS, ELECTRIC WIRE; *WELDING; WELDS; FEASIBILITY STUDIES; RELIABILITY.) (MATERIALS; METALS; ALLOYS; NICKEL; COPPER.)
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
AD-273 632 62-2-6 DIV. 8

(*TOOL STEEL; SHEETS; METAL PLATES; ARC *WELDING; *WELDING; HEAT TREATMENT, HARDENING; THERMAL STRESSES; FRACTURE (MECHANICS); TENSILE PROPERTIES; STRESSES; PRESSURE VESSELS.) TESTS; WELDS; MICROSTRUCTURE; IMPACT SHOCK; AIRCRAFT; GUIDED MISSILES; ROCKET CASES.
ELECTRIC BOAT DIV., GENERAL DYNAMICS CORP., GROTON, CONN.
AD-273 867 62-2-6 DIV. 17

***WELDS**

(*ROCKET CASES; MATERIALS; *SHEETS; *TITANIUM ALLOYS-BASE; ALUMINUM ALLOYS; CHROMIUM ALLOYS; VANADIUM ALLOYS; *WELDS; *FRACTURE (MECHANICS); HEAT TREATMENT, CRYSTAL STRUCTURE; MICROSTRUCTURE; AGING; HARDNESS; DATA.)
NAVAL WEAPONS LAB., DAHLGREN, VA.
AD-273 711 2-2-6 DIV. 17

***WIND TUNNELS**

(*WIND TUNNELS; INSTRUMENTATION; *BALANCES BY MAGNETIC FIELDS; DESIGN; MATHEMATICAL ANALYSIS; DIFFERENTIAL EQUATIONS; VECTOR ANALYSIS; CALIBRATION.) (SPHERES; DRAG; MODEL TESTS; *WIND TUNNEL MODELS.)
RESEARCH LABS. FOR THE ENGINEERING SCIENCES, U. OF VIRGINIA, CHARLOTTESVILLE.
AD-273 655 62-2-6 DIV. 30

***WORK FUNCTIONS**

(*THERMIONIC EMISSION; THERMODYNAMICS; THERMAL CONDUCTIVITY; *WORK FUNCTIONS; ATOMIC ENERGY LEVELS; ELECTRON TRANSITIONS; QUANTUM MECHANICS; MATERIALS; SEMICONDUCTORS; METALLIC COMPOUNDS.) (ALKALINE EARTH COMPOUNDS; OXIDES.) (TRANSITION ELEMENTS; BORIDES; CARBIDES; NITRIDES.) (RARE EARTH COMPOUNDS; BORIDES.) SOLID STATE PHYSICS; THEORY; ELECTRIC POWER PRODUCTION; THERMOELECTRICITY.
ALLIED RESEARCH ASSOCIATES, INC., BOSTON, MASS.
AD-273 533 62-2-6 DIV. 25

***X-RAY DIFFRACTION ANALYSIS**

(*STEREOCHEMISTRY; *X-RAY DIFFRACTION ANALYSIS; *POWDERS; *COMPLEX COMPOUNDS; *COMPLEX IONS; TRANSITION ELEMENTS; ARSINES; PYRIDINES; HALIDES; *CHELATE COMPOUNDS; CHROMIUM COMPOUNDS; MOLYBDENUM COMPOUNDS; TUNGSTEN COMPOUNDS; MOLECULAR STRUCTURE.)
UNIVERSITY COLL., LONDON (GT. BRIT.).
AD-273 634 62-2-6 DIV. 25

(*SINGLE CRYSTALS; *X-RAY DIFFRACTION ANALYSIS; CRYSTAL STRUCTURE; GONIOMETERS.) (*DATA PROCESSING SYSTEMS; COMPUTERS; *PROGRAMMING; PUNCHED CARD METHODS.) (CAMERAS; PHOTOGRAPHS BY REFLECTION.) (ERRORS; ANALYSIS.)
NAVAL RESEARCH LAB., WASHINGTON, D. C.
AD-273 719 2-2-6 DIV. 30

***X RAYS**

(*RADIATION INJURIES; FAST NEUTRONS; DOSE RATE, ANALYSIS.) (*X-RAYS; RADIATION TOLERANCE, MEASUREMENT.)
NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
AD-273 633 62-2-6 DIV. 20

***ZIRCONATES**

(SINTERED; *ZIRCONIUM COMPOUNDS; *DICXIDES; *CALCIUM COMPOUNDS; *ZIRCONATES; YTTRIUM COMPOUNDS; OXIDES; CERIUM COMPOUNDS; REFRACTORY MATERIALS; CERAMIC MATERIALS; HIGH TEMPERATURE RESEARCH.) (TEST METHODS; *THERMODYNAMICS; THERMAL STRESSES; THERMAL EXPANSION; THERMAL CONDUCTIVITY; BLACK-BODY RADIATION; SPECIFIC HEAT; MELTING; CRYSTAL STRUCTURE; DENSITY; POROSITY.) TABLES; MECHANICAL PROPERTIES; PHYSICAL PROPERTIES.
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 802 62-2-6 DIV. 14

***ZIRCONIUM COMPOUNDS**

(MATERIALS; *PHYSICAL PROPERTIES; THERMODYNAMICS; CORROSION; MECHANICAL PROPERTIES; TEST METHODS.) (*ABLATION; *COATINGS; ELECTRIC INSULATION; *GLASS TEXTILES; GRAPHITE; LAMINATES; ENCAPSULATION; EMBEDDING SUBSTANCES; *ZIRCONIUM COMPOUNDS; DIOXIDES.)

(*STAINLESS STEEL (PH15-7MO), HONEYCOMB CORES, SANDWICH PANELS.) (*TOOL STEEL (HGR PUNCH AND DIE, OLYMPIC FR DIE, SELECT R DIE, JET FORGE TOOL, VASCO 7152 TOOL, CK SPECIAL TOOL), DIES.)
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 801 62-2-8 DIV. 14

(SINTERED, *ZIRCONIUM COMPOUNDS, *DICXIDES, *CALCIUM COMPOUNDS, *ZIRCONATES, YTTRIUM COMPOUNDS, OXIDES, CERIUM COMPOUNDS, REFRACTORY MATERIALS, CERAMIC MATERIALS, HIGH TEMPERATURE RESEARCH.) (TEST METHODS, *THERMODYNAMICS, THERMAL STRESSES, THERMAL EXPANSION, THERMAL CONDUCTIVITY, *BLACK-BODY RADIATION, SPECIFIC HEAT, MELTING, CRYSTAL STRUCTURE, DENSITY, POROSITY.) TABLES, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES.
CHANCE VOUGHT CORP., DALLAS, TEX.
AD-273 802 62-2-8 DIV. 14

TECHNICAL ABSTRACT BULLETIN

1. AIRCRAFT AND FLIGHT EQUIPMENT

AD-273 565 Div. 1
(TISTA/WAW) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
X-15 AIRPLANE STABILITY AUGMENTATION SYSTEM,
by Lawrence W. Taylor, Jr., and George B. Merrick. Mar 62, 14p. incl. illus. 2 refs.
(Technical note D-1157)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1157.

This document is based on a paper presented at the Conference on the Progress of the X-15 Project, Edwards Air Force Base, Calif., November 20-21, 1961.

DESCRIPTORS: (*Rocket planes, Research planes, Hypervelocity vehicles, Stabilization systems, Damping.) (*Stabilization systems, Servo systems, Design, Flight testing, Reliability, Vibration, Hazards.)

The basic damper system currently installed in the X-15 airplane is described. Problems encountered during the development and flight testing of the system are discussed, and the reliability of the system is reviewed briefly. (Author)

AD-273 566 Div. 1
(TISTA/WAW) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
STRUCTURAL DYNAMIC EXPERIENCES OF THE X-15 AIRPLANE,
by Gareth H. Jordan, Norman J. McLeod, and Lawrence D. Guy. Mar 62, 14p. incl. illus. 1 ref.
(Technical note D-1158)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1158.

This paper is based on a paper presented at the Conference on the Progress of the X-15 Project, Edwards Air Force Base, Calif., November 20-21, 1961.

DESCRIPTORS: (Research planes, *Rocket planes, Design, Flight testing.) (*Airframes, Airplane panels, Failure (Mechanics) from Airplane noise, Rocket motor noise, Flutter, Vibration, Structures, Dynamics.) (Launching from Jet bombers.)

The structural dynamic problems anticipated during the design of the X-15 airplane are reviewed briefly, and the actual flight experiences with the airplane are described. The noise environment, acoustic fatigue problems, and panel-flutter experiences are discussed. Where these problems led to structural modifications, the modifications are described. (Author)

AD-273 567 Div. 1
(TISTA/WAW) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
MISSION PLANNING AND OPERATIONAL PROCEDURES FOR THE X-15 AIRPLANE,
by Robert G. Hoey and Richard E. Day. Mar 62, 18p. incl. illus. 3 refs. (Technical Note D-1159)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical Note D-1159.

This document is based on a paper presented at the Conference on the Progress of the X-15 Project, Edwards Air Force Base, Calif., November 29-21, 1961.

DESCRIPTORS: (*Rocket planes, Research planes, Hypervelocity vehicles, Parasite planes, Simulation of Control and Stability, Test methods, Flight testing, Programming of Flight paths, Human engineering of Control, Ground support equipment.) (Pilots, Training with Flight simulators.)

Mission-planning methods and techniques used for the X-15 airplane envelope-expansion flight-test program are discussed. Use of the six-degree-of-freedom ground-based simulator is indicated for prediction of performance, stability and controllability; development of piloting techniques and pilot training; evaluation of, and practice for, all possible emergency conditions; and energy-management development. Other pilot-training devices and the role of the ground-monitoring station are also described. Predicted trajectory data and actual flight results are compared. The initial reasons and the final justifications for conducting the X-15 envelope expansion by performance increment are presented. (Author)

AD-273 625 Div. 1
(TISTA/VGW) OTS price $8.60

Goodyear Aircraft Corp., Akron, Ohio.
INVESTIGATION OF ESCAPE CAPSULE SYSTEMS FOR MULTI-PLACE AIRCRAFT. PART I. PRELIMINARY INVESTIGATION.
Final rept., pt. 1,
by J. J. Vorachek, F. Milhoan and others.
Dec 61, 85p. incl. illus. tables, 10 refs.
(Contract AF 33(616)5017, Proj. 1362)
(WADC TR 57-329, pt. 1) Unclassified report

DESCRIPTORS: (Feasibility studies of *Jettisonable cockpits for High altitude, Ejection from Supersonic planes.) (Ejection seats, Pressure capsules, Design, Configuration, Human engineering, Aerodynamics, Vulnerability, Effectiveness, Deceleration, Parachute descents, Landing, Aviation safety, Military requirements.)

Findings are summarized of an investigation of 4 escape capsule systems for a hypothetical multi-place aircraft. The aircraft has been assumed to operate in a performance envelope having a maximum equivalent airspeed of 800 knots

through an altitude range from sea level to 55,000 ft and a Mach number of 4.0 from 55,000 to 100,000 ft with a flight duration of 30 hr. Four capsule configurations are evaluated: cockpit, nose section, tandem and individual. All the configurations tested provide the required escape potential, necessary crew comfort and access to work areas, and adequate survival potential. The individual capsule concept was the most desirable arrangement of the 4 concepts due to its weight factor, the least effect on aircraft availability, greatest escape potential, least susceptibility to damage, and the most positive separation factor from the aircraft. (Author)

AD-273 626 Div. 1, 9, 30
(TISTA/VGW) OTS price $19.75

Goodyear Aircraft Corp., Akron, Ohio.
INVESTIGATION OF ESCAPE CAPSULE SYSTEMS FOR MULTI-PLACE AIRCRAFT. PART II. PRELIMINARY DESIGN AND WIND TUNNEL TESTING OF AN INDIVIDUAL ESCAPE CAPSULE.
Final rept., pt. 2,
by F. M. Milhoan, J. J. Vorachek and J. D'Allura.
Dec 61, 282p. incl. illus. tables, 26 refs.
(Contract AF 33(616)5017, Proj. 1362)
(WADC TR 57-329, pt. 2) Unclassified report

DESCRIPTORS: (Design of *Jettisonable cockpits, Ejection seats for Supersonic planes.) (*Model tests on Tracks (Aerodynamics), Wind tunnel models.) (Aerodynamic configurations, Pressure capsules, Human engineering, Parachute descents, Stabilization systems, Recovery, Sea rescues, *Aviation safety.) (Tests, Lift, Drag, Pitch, Moments, Yaw, Stability, Data, Tables.) (Effectiveness of Towed bodies with Pneumatic devices for Stabilization.)

Design and dynamic model and wind tunnel model testing is reported for an individual escape capsule as part of a program for the investigation of escape capsule systems for a hypothetical multi-place aircraft. The capsule provides safe escape over an aircraft performance envelope having a maximum equivalent airspeed of 800 knots through an altitude range from sea level to 55,000 ft and a Mach number of 4.0 from 55,000 to 100,000 ft with a flight duration of 30 hr. The preliminary design is described. Results from stress and weight analyses are included. A preliminary performance and stability analysis of 3 capsule stabilization systems, including fins, boom-balloon configurations, and trailing drag bodies, was made, and a system comprised of a variable sized inflatable drag body was selected and further analyzed. Data used for the analysis was obtained from quarter-scale model free-flight tests and transonic and supersonic wind tunnel tests from Mach 0.5 to 3.0. Graphical results from the wind tunnel tests are included. (Author)

AD-273 691 Div. 1, 16
(TISTA/WAW) OTS price $7.60

Applied Psychology Corp., Arlington, Va.
THE ROLE OF PAINT IN MID-AIR COLLISION PREVENTION.
Final rept. no. 1.
Dec 61, 64p. incl. illus. tables, 46 refs.
(Contract FAA/BRD-127)
Unclassified report

DESCRIPTORS: (*Aviation accidents, Aviation safety, Analysis, Countermeasures.) (Pilots, Human engineering, Vision, Visual thresholds, Atmosphere.) (Airplanes, Detection, *Aircraft finishes, Visibility, Theory, Analysis, Tests.) (Fluorescence, Paints, Physical properties, Optics.) (*Aircraft markings, Design, Costs, Maintenance, Military requirements, Life expectancy.)

Research is presented on visual collision avoidance techniques which deals with the use of exterior surface treatments. Specifically, the aim of the research was to identify human factors considerations and related design requirements for a maximally effective paint pattern. Methods and results of laboratory studies, field observations, and flight tests designed or conducted in this program are summarized, and pertinent literature is reviewed. Economic considerations in applying and maintaining paint treatments are described. Findings indicate that, for conspicuity purposes, some paint on the exterior surfaces of an aircraft is measurably better than no paint. An optimum standardized pattern would have to include elements for positive and negative brightness contrast, and color contrast. This is best accomplished with high-reflectance paints on upper surfaces of fuselage, low-reflectance paints on under surfaces, and color on fixed surfaces of empennage. Fluorescent paints in the orange and red portions of the spectrum are to be preferred over other colors where visual recognition of color is important. (Author)

AD-273 831 Div. 1
(TISTA/WAW) OTS price $6.60

Motorola, Inc., Riverside, Calif.
DEVELOPMENT OF THE PILOT WARNING INSTRUMENT (PWI).
Final engineering rept., May 60-Feb 61,
by A. Farkas and G. D. Morehouse. Feb 62, 66p. incl. illus. (Rept. no. RLF-3852-1)
(Contract FAA/BRD-248)
Unclassified report

DESCRIPTORS: (*Aviation safety, *Aviation accidents, Countermeasures, Aircraft equipment, Electronic equipment, Radio equipment, *Radar beacons, Design, Electronic circuits.) (Radio transmitters, Discriminators, Power supplies, Radio receivers, Data processing systems, Display systems, Electronic circuits, Design.) Programming, Coding.

The theory and operation of a metric wave pilot warning instrument are presented in detail. Each aircraft transmits its altitude as frequency modulation at 135.54 megacycles. This interrogating pulse of 500 microseconds is transmitted omnidirectionally and reply is made by all coaltitude aircraft with a 15 microseconds pulse at 135.54 megacycles. The direction of the reply is determined by receiving the signal on three spaced antennas and comparing the phase. The distance and angle of arrival are presented on a multiple sector display. The several individual circuits and functions are discussed adequately for maintenance of the equipment during evaluation and test. Complete schematics and critical waveforms are included. Recommendations for improvement are presented. (Author)

AD-273 897 Div. 1, 14
(TISTM/BRW) OTS price $5.60

Goodyear Aircraft Corp., Akron, Ohio.
EVALUATION OF HIGH-TEMPERATURE CAST-IN-PLACE TRANSPARENT PLASTIC LAMINATES SUITABLE FOR

CANOPIES ON SUPERSONIC FIGHTER AIRCRAFT.
Quarterly progress rept. no. 9, 9 Nov 61-8 Feb 62.
8 Feb 62, 51p. incl. illus. tables, 3 refs.
(Rept. no GER 10613)
(Contract NOa(s) 59-6146-c)
Unclassified report

DESCRIPTORS: (*Aircraft canopies, *Transparent panels, Plastics, *Laminates, Materials, Heat resistant polymers, Epoxy resins, Glass, Thermal insulation, Casting, Feasibility studies, Tests.) (Supersonic planes, Jet planes, Jet fighters, Aircraft canopies, Windshields, Production, Design, Thermal stresses, Shock resistance.) Test equipment, Test methods.

The Thermo-Shield laminates are of 3-ply construction with a 0.250-in.-thick load-bearing face sheet of stretched MIL-P-8184 (Plexiglas 55), a 0.125-in.-thick castable interlayer (code F-3), and a 0.250-in.-thick thermal-barrier face sheet. The optical and fabrication feasibility study of full-scale Thermo-Shield canopies was successfully demonstrated. All pilot testing to check out test equipment and test procedures were performed and the first gradient temperature destruction test on a full scale Thermo-Shield canopy was completed. A boundry layer air temperature of 455 F with an associated canopy outboard thermal barrier outer surface temperature of 400 F was reached before initial failure was experienced. (Author)

2. ASTRONOMY, GEOPHYSICS AND GEOGRAPHY

AD-273 451 Div. 2, 20
(TISTP/MFA) OTS price $1.60

Massachusetts Inst. of Tech., Cambridge.
APPLICATION OF WEATHER RADAR TO FALLOUT PREDICTION.
Quarterly technical rept. no. 15, 1 Sep-30 Nov 61, by Pauline M. Austin. 15 Dec 61, 12p. incl. illus. table.
(Contract DA 36-039-sc-75030, Proj. 3A99-07-001-01-03)
Unclassified report

DESCRIPTORS: (Meteorology, *Meteorological radar, Radar signals for *Radioactive fall-out from *Nuclear explosions.) (*Instrumentation, Meteorological data, Storms, Precipitation.) (Digital computers, Data processing systems, Magnetic tape.) Research program administration.

Computations on the fallout pattern for a 10 KT detonation and its modification by precipitation yielded useful results concerning the manner in which the radioactive cloud diffuses in the atmosphere. The analysis is discussed briefly. A comparison of the rainfall amounts as measured by the radar and by a network of rain gauges has been made for a particular storm. The accuracy of the radar data cannot be definitely ascertained, but it is clear that the rain-gauge network underestimated the rainfall by a significant amount. (Author)

AD-273 457 Div. 2, 8
(TISTP/MFA) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
SUN TRACKING BY THE MINITRACK NETWORK STATIONS, by E. J. Habib, J. H. Berbert, and D. W. Harris. Mar 62, 10p. incl. illus. 2 refs. (Technical note D-1121)
Unclassified report

This paper was presented at the 13th General Assembly of the International Scientific Radio Union, University Coll., University of London, London, England by Dr. Robert J. Coates of the Goddard Space Flight Center.

Also available from NASA, Wash, 25, D. C., as NASA Technical note D-1121.

DESCRIPTORS: (Astronomy, *Sun, *Tracking by *Communication systems, Interferometers, *Electrical networks, Antennas.) (Solar disturbances, Solar flares, Solar corona, Noise (Radio).) (Instrumentation, Preamplifiers, Detectors, Band-pass filters, Recording devices.)

Meridian transits of the sun were recorded daily on a frequency of 108 Mc by the Minitrack network of stations. By comparing the position of the solar noise center, as found on the record, with the predicted position of the optical center, the displacement of the 108-Mc emission point from the center of the solar disk is determined. A number of stations may track the sun simultaneously. Analysis of the data from these stations shows that in approximately 75 percent of all passes the polar coordinates of the noise center as observed by these widely separated stations are in good agreement. (Author)

AD-273 458 Div. 2
(TISTP/MFA) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
TRACKING OF CYGNUS A AND CASSIOPEIA A BY THE NASA 108-MC MINITRACK SYSTEM,
by E. J. Habib, J. H. Berbert, and D. W. Harris. Mar 62, 13p. incl. illus. tables, 11 refs.
(Technical note D-1122)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA technical note D-1122.

DESCRIPTORS: (*Radio astronomy, *Interferometers, *Optical tracking of *Satellite vehicles, Space flight.) (Calibration, Optical equipment, Radio signals, Signal-to-noise ratio.) (Orbital flight paths of Galaxies, *Stars.) Celestial mechanics.

Meridian transit passes of Cygnus A and Cassiopeia A are being recorded by the 108-Mc Minitrack system that was designed for precise satellite tracking. This paper covers the period from October 16, 1960 to December 31, 1960. The data were reduced to determine the flux densities and celestial positions of these two sources. The values obtained by this system are within the experimental error of those determined by other experimenters on slightly different frequencies. (Author)

AD-273 459 Div. 2, 12, 15
(TISTP/MFA) OTS price $2.50

National Aeronautics and Space Administration, Washington, D. C.
CELESTIAL GEODESY,

by W. M. Kaula. Mar 62, 120p. incl. tables, 280 refs. (Technical note D-1155)
Unclassified report

Also available from NASA, Wash. 25, D. C. as NASA Technical note D-1155.

DESCRIPTORS: (*Celestial mechanics, Geodesics, *Geodetic astronomy.) (*Inertial navigation, Orbital flight paths, Satellite vehicles, Moon, Sounding rockets.) (Earth, Gravity, Relativity theory.) (Terrain, Geophysics, *Geodetic data, Geometry.) (Computers, Errors, Analysis.) (Transformations (Mathematics), Taylor's series, Fourier analysis, Integral equations.) *Bibliography.

The geodetic use of rockets, artificial satellites, and the moon is reviewed. The discussion covers in turn dynamics, geometry, observational techniques, comparison with terrestrial geodesy, and geophysical implications. (Author)

AD-273 516 Div. 2
(TISTP/FR) OTS price $2.60

Rand Corp., Santa Monica, Calif.
ESSENTIAL FACTORS OF THUNDERSTORM FORECASTING,
by J. D. Sartor. Mar 62, 23p. incl. illus. tables, 24 refs. (Memo. no. RM-3049-PR)
(Contract AF 49(638)700)
Unclassified report

DESCRIPTORS: (*Weather forecasting of *Thunderclouds and *Storms by Statistical analysis of Moisture, Wind and Pressure of Atmosphere.)

A method for formulating a mathematical relationship between the occurrence of thunderstorms and several essential prior conditions is demonstrated. A winnowing of 24 thunderstorm-forecasting parameters led to the isolation of five essential factors and an expression demonstrating their possible relationship to thunderstorms. (Author)

AD-273 519 Div. 2
(TISTP/MFA) OTS price $1.25

Stanford Research Inst., Menlo Park, Calif.
EARTH DEFORMATION FROM A NUCLEAR DETONATION IN SALT.
Preliminary rept. on Project Gnome,
by R. B. Hoy and R. M. Foose. 22 Jan 62, 54p. incl. illus. 11 refs. (Rept. no. PNE-109P)
Unclassified report

DESCRIPTORS: (Geology, *Geophysics, Earth, *Deformation by *Nuclear explosions in Salts, Rock.) (*Detonation waves, Fracture (Mechanics), Fragmentation of Terrain.) (*Aerial photography, Experimental data.) New Mexico.

Measurement of rock deformation caused by the Gnome explosion revealed that maximum permanent surface displacement was confined to an area within 100 meters of surface ground zero. The surface above ground zero remained permanently raised 0.3 to 0.5 meters after an initial transient displacement estimated to be 1.5 meters. The permanent deformation was characterized by fractures with offsets up to 0.2 meters. Abundant hair-line fractures were observed out to 300 meters. Occasional small fractures were noted as far as 1000 meters from surface ground zero. Underground, fractures were observed in the shaft lining at 23, 27, 49, and 146 meters, with a slight water seep at 146 meters. The tunnel examination -- which prior to January 10 had been limited to the station near the bottom of the shaft -- revealed an irregularly cone-shaped pile of slabs reaching a maximum height of 1.2 meters at the center of the room. Four large slabs had fallen from the walls and fine spalling had removed most of a reference grid which had been painted on the wall. (Author)

AD-273 524 Div. 2
(TISTP/MFA) OTS price $10.10

Washington U., Seattle.
STATION ARLIS-1 OCEANOGRAPHY. PART I. RESULTS 1960 AND 1961.
Scientific rept.,
by G. E. Brayton. Feb 62, 20p. illus. 6 refs.
(Contract Nonr-47724, Proj. NR 307-252)
Unclassified report

DESCRIPTORS: (*Oceanography, Analysis of Physical properties and Chemical properties of *Oceanographical data from *Arctic regions, Ice.) (Temperature, Salinity and Depth finding by Sampling.) (Density of Sea water.) Oceanographical charts.

An analysis of the physical and chemical oceanographic data collected during the winter of 1960-1961 in the Arctic Ocean from the Arctic Research Laboratory's Ice Station (ARLIS I) is presented. A combined navigational and station location chart together with graphs of temperature, salinity, and sigma-t are included. All of the bathythermograph slides have been reproduced and are also included. (Author)

AD-273 525 Div. 2
(TISTP/MFA) OTS price $9.60

Washington U., Seattle.
STATION ARLIS-1 OCEANOGRAPHY. PART II. TABLES 1960 AND 1961.
Scientific rept.,
by G. E. Brayton. Feb 62, 1v. incl. tables.
(Contract Nonr 47724, Proj. NR 307-252)
Unclassified report

DESCRIPTORS: (*Tables for *Oceanography, Analysis of Physical properties and Chemical properties of *Oceanographical data from *Arctic regions, Ice.) (Temperature, Salinity and Depth finding by Sampling.) (Density, Sea water.) (Weather forecasting, Wind, Clouds, Visibility.)

AD-273 597 Div. 2, 12
(TISTA/VGW) OTS price $2.60

Air Force Proving Ground Command, Eglin Air Force Base, Fla.
THE TIME EQUATION OF SATELLITE ORBIT THEORY.
Final rept. on Proj. Space Track,
by George B. Findley. Mar 62, 24p. incl. illus. table, 2 refs. (APGC TDR 62-8)
Unclassified report

DESCRIPTORS: (Mathematical analysis of *Satellite vehicle trajectories, Orbital flight paths, Position finding, Mathematical prediction with Time, Equations, Theory.)

The time equation of satellite orbit theory is defined as the equation used to predict the time at which a satellite will either cross the earth's equator or pass through the perigee point of its orbit, depending, respectively, on whether the nodal or anomalistic period is used. This paper gives a derivation of the time equation through terms of order of the fourth time derivative of the period. It is shown that when

the time equation is expressed as a polynomial the initial period is the sum of the coefficients of the variable. Since the time equation is also used to determine the numerical values of its coefficients by least square fitting the equation to observations, equations are derived for the first and second time derivatives in terms of these coefficients. An analysis of some NORAD and NSSCC data indicates, at least for certain satellites, that determining optimal values of these coefficients to use in the satellite position predicting method is closely related to the time interval over which the least square method is applied. (Author)

AD-273 599 Div. 2
(TISTP/MFA) OTS price $3.60

Arizona State Coll., Flagstaff.
OBSERVATIONS OF ATMOSPHERIC SCATTERING NEAR THE SUN'S LIMB,
by Arthur Adel. 31 Jan 61, 23p. incl. illus. tables, 6 refs. (Scientific rept. no. HB-9)
(Contract AF 19(604)2177)
(AFCRL-61-240) Unclassified report

DESCRIPTORS: (*Solar spectrum, *Scattering of *Infrared radiation in Atmosphere.) (Astronomical observatories, Telescopes, Monochromatic light.) (Air mass analysis, Precipitation, Water.) Astronomical data, Arizona.

The scattered solar spectrum, 3.25 minutes of arc from the limb of the sun, extending from 0.7 microns to 4.7 microns, has been observed at Flagstaff, Arizona. The scattering efficiency is observed to be greater at the longer wavelengths. (Author)

AD-273 604 Div. 2
(TISTP/MFA) OTS price $7.60

Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
IMPACT STUDIES ON LUNAR DUST MODELS AT VARIOUS VACUUMS.
Master's thesis,
by Richard Lansing Greer. Jan 62, 69p. incl. illus. tables, 33 refs. (ASD TR 61-595)
(Proj. 8119) Unclassified report

DESCRIPTORS: (Simulation of *Space environmental conditions on the *Moon, *Vacuum systems.) (Analysis, Tests of Impact shock in *Volcanic dust and Rock.) (Feasibility studies and *Test methods, Experimental data, Photographic analysis.) Theses.

An analysis of factors relevant to lunar environmental simulation shows that the dynamic behavior of lunar dust models in various vacuums must be studied to establish the degree of vacuum required of a lunar simulator. Various silicic and basaltic rock dusts were selected as lunar dust models and tested under a range of vacuums. Although crater width measurements indicate lunar dust models do not change their resistance to impact at vacuums, depth of penetration measurements do show a continuous change in resistance. The behavior of lunar dust particles depends upon both particle size distribution and particle microstructure. The effects of hold times at vacuum, container walls, dust shallowness, and the composition of the residual atmosphere on dust behavior are analyzed.

AD-273 608 Div. 2
(TISTP/FR) OTS price $1.10

Aerospace Information Div., Washington, D. C.
TEMPERATURE OF VENUS.
28 Feb 62, 2p. (AID rept. no. 62-27; Trans. from Astronomicheskiy zhurnal. v. 38, no. 6, pp. 1115-1117, Nov-Dec 1961)
Unclassified report

DESCRIPTORS: (*Venus, Temperature, Rotation, Measurement, Extraterrestrial radio waves.)

Radio emission from Venus was measured with a 22-m radio telescope during the period of inferior conjunction in 1961. From the middle of March to the beginning of June, observations were made at wavelengths of 4 and 8 mm and 9.6 cm and from 26 May through 10 July, at the 3.3-cm wavelength. The shifting of the brightness-temperature minimum from the point of inferior conjunction to the eastern elongation indicates that the rotation of Venus occurs in the same direction as its revolution around the sun. The shifting is also considered to support the hypothesis that the rotation period is not equal to the revolution period. The wide variations in temperature may be attributed to changes in electron accumulations in the Venusian ionosphere. (Author)

AD-273 634 Div. 2
(TISTP/TL) OTS price $1.60

Naval Ordnance Lab., White Oak, Md.
SEAWATER DENSITY IN THE OCEAN AS A FUNCTION OF DEPTH, AND A METHOD FOR UTILIZING THIS INFORMATION IN DESIGN OF PRESSURE VESSELS WHICH WILL REMAIN IN A CONSTANT DEPTH RANGE BETWEEN THE SURFACE AND THE BOTTOM,
by William F. Warren. 8 Dec 61; 6p. illus. tables (Rept. no. NOLTR 61-179)
Unclassified report

DESCRIPTORS: (*Sea water, *Density in the *Oceans as a method of Depth finding for *Pressure vessels, Design.)

Curves of maximum and minimum seawater density are given for the North Atlantic and for the World Ocean (Atlantic, Indian, and Pacific). These curves show that a sub-surface free floating pressure vessel is possible for all depths below 300 fathoms, If a more limited area of the ocean is to be considered, then a minimum planting depth even less than that stated above should be possible, using the described methods.

AD-273 659 Div. 2, 25
(TISTP/MFA) OTS price $1.60

Arizona State Coll., Flagstaff.
INFRARED ATMOSPHERIC STUDIES.
Final rept., 10 Mar 57-31 Oct 61,
by Arthur Adel. 30 Nov 61, 8p. 4 refs.
(Contract AF 19(604)2177, Proj. 7670)
(AFCRL 62-212)
Unclassified report

DESCRIPTORS: (*Solar atmosphere, *Infrared radiation, Microwaves, Ultraviolet radiation, Meteorology, Solar flares, *Solar spectrum, Astronomical observatories.) (Research program administration, Scientific reports.)

Division 2 - ASTRONOMY, GEOPHYSICS AND GEOGRAPHY

AD-273 686 Div. 2, 8
(TISTP/MFA) OTS price $7.60

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
AN EXPERIMENTAL INVESTIGATION OF LUNAR AND AURORAL SCATTERED SIGNALS. PART I LUNAR ECHOES.
Final rept.,
by H. A. Von Biel. 15 Jan 62, 74p. incl. illus.
(Rept. no. CM-1393-P-7)
(Contract AF 19(604)6116, Proj. 4603)
(AFCRL 62-78) Unclassified report

DESCRIPTORS: (*Moon, Radio signals, Very high frequency, Radiofrequency spectrum analyzers, Electromagnetic waves, Reflection, *Extraterrestrial radio waves, *Radio astronomy, *Aurorae.) (*Echo ranging, Doppler systems, Parabolic antennas, *Ionosphere, Polarization.) (Instrumentation, Oscillators, Oscillator circuits, Parametric amplifier, Recording devices.)

An experimental investigation of lunar echoes at 915 mc has been conducted. The transmission loss between isotropic radiators over the earth-moon-earth path was established as being 280 db at 915 mc. This result, in conjunction with transmission losses reported by other investigators in the frequency range from 200 mc to 3000 mc, leads to the conclusion that the radar cross section of the moon is frequency dependent and decreases with increasing frequency at a rate of about 6 db per octave. At 915 mc, the lunar radar cross section was equal to 4.2 x 10 to the 10th power square meters. After detection, the lunar echo at 915 mc exhibits Rayleigh-like fading with an average 10- to 90-percent fading range of about 14 db. There is evidence that the lunar echo is not entirely randomly phased but contains a steady-signal component which is in the ratio of 1.5 to 1 with the rms scattered-signal components, i.e. 47 percent scattered power and 53 percent specular reflected power. (Author)

AD-273 715 Div. 2, 25
(TISTP/WH) OTS price $1.25

National Aeronautics and Space Administration, Washington, D. C.
AN ADDITION TO THE YALE TABLES FOR THE DEVELOPMENT OF THE DISTURBING FUNCTION,
by Lloyd Carpenter. Mar 62, 49p. incl. tables, 3 refs. (Technical note D-1290)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1290.

DESCRIPTORS: (*Celestial mechanics, *Perturbation theory, Series, Functions, Tables.)

The tables for the development of the disturbing function, published by Brown and Brouwer in 1933, are extended for use in investigating sharp commensurabilities and in computing long period effects in the motions of minor planets with large orbital semi-major axes. The logarithms of the coefficients of cos iS in the expansions of Δ^{-1} and Δ^{-3} are tabulated for i = 12 through 24. (Author)

AD-273 725 Div. 2, 5
(TISTP/FR) OTS price $10.10

Page Communications Engineers, Inc., Washington, D. C.
ARCTIC ABSORPTION AT OBLIQUE INCIDENCE OBSERVED AT 32 MC ON RIOMETERS AND SCATTER SIGNALS.
Final rept.
Dec 61, 121p. incl. illus. tables, 12 refs.
(Rept. no. PCE-R-9063A)
(Contract AF 19(604)7354)
(AFCRL 62-26) Unclassified report

DESCRIPTORS: (*Extraterrestrial radio waves, *Absorption, Ionosphere, Aurorae, Arctic regions.) (Radio communication systems, *Scattering, Ionosphere, Arctic regions.)

Ionospheric absorption in the arctic was studied using riometers and ionospheric scatter signals at 32 mc. Oblique measurements were made in all cases on three antennas at Sondrestrom, Greenland, pointing NW, SE, and SW. Several events in the period September 1960 through October 1961 are analyzed. Total ionospheric absorption is inferred from riometer measurements, while low-level absorption is inferred from the scatter signal-intensity variations. Auroral absorption observations indicated that the size of absorbing areas usually does not exceed 10,000 sq km. Evidence of noise generated in the aurora is discussed. Polar-cap absorption events showed severe absorption, often exceeding 30 db at oblique incidence. Polar-cap absorption effects were more intense in the auroral zone, probably because of a strong dependence on solar zenith angle, although the effects persisted longer at the higher latitudes. Good correlation between the onset of the events on the various antennas showed the effects to be widespread. The signal and noise absorption variations, when compared with a simple model, indicate considerable variation of scattering and/or absorption heights during the events. (Author)

AD-273 758 Div. 2, 12, 30
(TISTA/VGW) OTS price $1.60

Air Force Cambridge Research Labs., Bedford, Mass.
GEOPHYSICAL EXPLORATIONS IN AEROSPACE DURING 1961,
comp. by Ronald A. Bena. 1 Mar 62, 18p.
Unclassified report

DESCRIPTORS: (Satellite vehicles, Sounding rockets, High altitude, Meteorological balloons, Lunar probes, *Geophysical explorations of *Upper atmosphere and *Space environmental conditions.) (Instrumentation, Tests.) (Density, Pressure, Temperature, Ultraviolet radiation, Electromagnetic properties, Ions, Electrons, Plasma physics, Cosmic rays, Gamma rays, Noise (Radio), Radiometers, Geodesics, Meteorites, Moon, Surface properties, Meteorology, Atmosphere models.)

This report summarizes the environmental research effort conducted by the AFCRL during 1961. Research vehicles used in this program fall into three classes: sensors mounted on low-cost research rockets, sensors mounted piggyback on test vehicles such as Atlas missiles and Agena satellites, and sensors flown on high-altitude research balloons. (Author)

AD-273 765 Div. 2
(TISTP/FR) OTS price $4.60

Johann Wolfgang Goethe U. (Germany).
INVESTIGATIONS ON TROPOSPHERIC WASH-OUT.
Annual rept. no. 2,
by Hans-Walter Georgii and Erich Weber. Aug 61, 28p. incl. 21 refs.
(Contract AF 61(052)249)
(AFCRL 62-288) Unclassified report

DESCRIPTORS: (*Atmosphere, *Clouds, *Aerosols, Gases, Condensation, Nuclei, *Precipitation, Sedimentation, Diffusion, Wash-out.) Germany.

The results are presented of investigations on aerosol- and trace-gas rain-out and wash-out by cloud- and rain droplets. These investigations were performed during last year at four different locations, namely Frankfurt/Main, Taunus observatory, Mt. Kleiner Feldberg, observatory on Mt. Zugspitze and at St. Moritz, Switzerland. These stations show a wide variety with respect to altitude, climate, supply and production of atmospheric trace-substances. Besides the chemical analysis of individual rainfalls, gaseous traces and aerosols were also microchemically analyzed. During the second stage of the investigation, a detailed picture of individual rainfalls was gained by continuous records of the variation of certain components during rainfall. (Author)

AD-273 769 Div. 2
(TISTP/FR) OTS price $3.60

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta.
AN ANALYSIS OF RADIO METEOR DATA OBTAINED BY SMYTH RESEARCH ASSOCIATES.
Final rept. on Proj. A-491,
by M. L. Meeks. Sep 61, 24p. incl. illus. tables, 6 refs.
(Contract AF 19(604)6625)
(AFCRL 62-145) Unclassified report

DESCRIPTORS: (*Meteors, Ionization, Ionosphere, Detection, Radar, Statistical analysis.) (Radio astronomy, Radar.)

Published data obtained by Smyth Research Associates on high-power high-gain meteor propagation at 200 Mc/s for 3 days in November 1957 were compared with predictions. Three different forms were assumed for the radiant distribution. The assumed distributions consisted of three sources on the ecliptic, at the apex and at 65 degrees from the apex toward and away from the sun. The first distribution consisted of three points on the celestial sphere, and the second and third distributions covered successively larger areas centered on these points at the apex and near the sun and anti-sun. The third distribution, consisting of a relatively small contribution from the apex and broad contributions from the sun and anti-sun concentrations, gave the best agreement with the data. The apex contribution appeared weak and varied from day to day. The sun and anti-sun contributions were nearly equal, showed little change from day to day, and seemed to extend beyond a 30 degrees radius. The contributions of the anti-sun concentration occurred 1 or 2 hours earlier than predicted. (Author)

AD-273 798 Div. 2, 6, 8
(TISTP/WH) OTS price $8.10

Boeing Scientific Research Labs., Seattle, Wash.
BOEING LOBE SWEEP INTERFEROMETER SYSTEM,
by John Lansinger and Ralph Gagnon. Dec 61, 81p. incl. illus. tables, 29 refs. (Document no. D1-82-0122)
Unclassified report

DESCRIPTORS: (*Interferometers, Very high frequency.) (*Solar disturbances, Solar noise, Measurement, Radio signals, Phase measurement, Position finding.) *Radio astronomy.

A lobe sweep interferometer system is described. Continuous measurements are made of the intensity of the total coherent noise received from the sun at 221 mc and the phase difference between the signals from two antennas. A phase lock method of maintaining a 1 kc difference between two mixer injection signals at 251 mc is described. A phase compensator is discussed in which a fixed phase relationship is maintained between a reference signal and the 1 kc signal resulting from a fictitious source at the predicted position of the sun. It is shown that the use of the compensator simplifies angle measurements of burst positions and facilitates measurement of the position of the radio center of the sun. A discussion is given regarding the interpretation of the received data to provide position measurements of bursts in relation to solar co-ordinates. The effects of fringe blurring and correction for an extended source distribution are discussed. Several factors affecting the precision of position measurements are presented. (Author)

AD-273 816 Div. 2, 13
(TISTP/FR) OTS price $5.60

Air Force Cambridge Research Labs., Bedford, Mass.
LOCATION OF A LUNAR BASE,
by John W. Salisbury and Charles F. Campen, Jr. Oct 61, 44p. incl. illus. 44 refs. (GRD Research notes no. 70; Rept. no. AFCRL-870)
(Proj. 7698)
Unclassified report

DESCRIPTORS: (*Moon, *Extraterrestrial bases.) (Moon, Mountains, Volcanoes, Craters, Rock, Lava, Volcanic dust, Rilles.) (Moon, Geology, Materials.) (Moon, Meteorites.)

The two major theories of lunar substructure are reviewed as pertinent to the location of a lunar base. The meteoric theory favors a moon base located in the highlands where the collapse hazard is at a minimum. Lunar probes for experimental verification of these conclusions are discussed. Surface characteristics would not particularly limit base location, but natural resources play a most important part. Mineral deposits must be large, centralized, and predictably located. It is suggested that vital water deposits may be found beneath chain craters and rilles, again suggesting a highlands location. The per capita, per day needs for oxygen, nitrogen, and water of lunar-based personnel are detailed; solar energy as a power source for mineral extraction is proposed. The initial location of a space vehicle terminal is limited by present propulsion systems to the western quadrant of the visible lunar face. Because of tremendous surface variations in temperature, the major lunar base complex would be underground. After detailed consideration of all the foregoing factors, a site south of the Hyginus Rille, near the Crater Agrippa, is suggested for an initial lunar base site. (Author)

AD-273 838 Div. 2
(TISTP/FR) OTS price $7.60

Ionosphere Research Lab., Pennsylvania State U., University Park.
A REPRESENTATION OF THE TERRESTRIAL ATMOSPHERE FROM 100 KM TO 3000 KM.
Scientific rept. no. 155 on Ionospheric Research, by Marcel Nicolet. 1 Feb 62, 66p. incl. illus. tables, 72 refs.
(Contract AF 19(604)4563 and NSF Grant G-18983)
(AFCRL 62-409) Unclassified report

Division 3 - CHEMICAL WARFARE EQUIPMENT AND MATERIALS
Division 4 - CHEMISTRY

DESCRIPTORS: (Recombination reactions and Diffusion, Density, Temperature and Barometric pressure of Atomic nitrogen and Atomic oxygen.) (*Atmosphere, Honosphere, Heterosphere and Thermosphere.) *Atmosphere models.

The combined evidence from observational data and theoretical analysis are used to give a representation of the terrestrial atmosphere from 100 to 3000 km. (Author)

AD-273 857 Div. 2
(TISTP/FR) OTS price $9.10

Blue Hill Meteorological Observatory, Harvard U., Milton, Mass.
TWILIGHT INTENSITY AT 20 DEGREE ELEVATION RESULTS OF OBSERVATIONS,
by F. E. Volz. Dec 61, 106p. incl. illus. tables, 5 refs. (Scientific rept. no. 2)
(Contract AF 19(604)4546)
(AFCRL-62-261 (a))
Unclassified report

DESCRIPTORS: (Measurement of *Twilight with *Photometers.) (Measurement of Density of Particles in Atmosphere at Twilight.) (Atmosphere, Optics.)

A total of about 100 twilights were recorded, mainly between September, 1959, and September, 1960, with a few up to November, 1961. The results at 20 degrees elevation are presented in chronological sequence in the form of logarithmic intensity gradients, color ratios and absolute green intensities, all as functions of the sun depression. Weather maps and cloud cross-sections along the path of the setting (or rising) sun provide some information on possible cloud interference. Daytime turbidity data, visual purple light observations and astronomical data are also given. Details of the measurements, evaluation procedures and data reduction are discussed, together with procedures and results of instrument calibrations. (Author)

3. CHEMICAL WARFARE EQUIPMENT AND MATERIALS

AD-273 637 Div. 3, 14
(TISTB/AW) OTS price $1.60

Naval Research Lab., Washington, D. C.
STUDIES OF THE MUSTARD GAS - PAINT SYSTEM. PART 1 - THE EVAPORATION OF MUSTARD GAS FROM PAINT FILMS,
by A. Stamulis. 28 Feb 62, 18p. incl. illus. tables, 15 refs. (NRL rept. no. 5712)
Unclassified report

DESCRIPTORS: (*Mustard gas, Vaporization, Evaporation, Penetration, Surfaces, Paints, Films.) (*Chemical warfare agents, *Decontamination by Climatic factors, Atmosphere.)

Wind-tunnel studies were conducted to determine the evaporation kinetics of liquid drops of mustard gas (HD) from painted and nonpainted surfaces. The evaporation process was divided into two characteristic periods: The first, the exposed-liquid-surface period, is the period in which liquid HD is exposed to the atmosphere. The second, the sorbed-liquid period, is that in which all of the remaining HD resides within the absorbent paint film. (Author)

4. CHEMISTRY

AD-273 466 Div. 4
(TISTM/EJH) OTS price $2.60

University Coll., Dublin (Eire).
ELECTRONIC EFFECTS IN ORGANOMETALLIC COMPLEXES,
by D. A. Brown and H. Sloan. Jan 62, 25p. incl. illus. tables, 14 refs. (Technical rept. no. 1)
(Contract N62558-2381)
Unclassified report

DESCRIPTORS: (*Metalorganic compounds, *Complex compounds, *Chelate compounds, Solvent action, *Chemical bonds, Atomic orbitals, *Molecular spectroscopy, Molecular association, Theory.) (Toluidines, Anilines, Benzenes, Chromium compounds, Carbonyl radicals.) Organic solvents.

Contents:
Molecular orbital theory
Comparison with experiment
Solvent effects
N-H stretching frequencies
pKa values of aniline complexes

AD-273 469 Div. 4
(TISTM/EJH) OTS price $1.10

Los Angeles State Coll., Calif.
BASE CATALYZED REACTIONS OF BORON HYDRIDES. Final rept., Feb 61-Feb 62,
by Thomas P. Onak. 1 Feb 62, 7p. incl. illus. tables, 7 refs.
Unclassified report

DESCRIPTORS: (*Borohydrides, *Organoboranes, *Pentaboranes, Deuterated compounds, Synthesis, Nuclear magnetic resonance, Molecular structure.) (Pentaboranes, Chemical reactions, Butenes, Pentenes, Catalysts, Methyl radicals, Pyridines.)

Several B4CnH2n+4 compounds (n = 3;4, from 2-butyne;5, from 1-pentyne) were synthesized from pentaborane and alkynes in the presence of 2,6-dimethylpyridine. A mechanism study of the base catalyzed formation of B4CnH2n+4 compounds has led to the postulation of an abbreviated pathway. In the course of the mechanism study, apical-deuteropentaborane was synthesized. Although a postulated intermediate B4H6.2,6-dimethylpyridine wasn't isolated, another B4H6-Lewis-base adduct, B4H7(-) with boron trifluoride ethyl etherate yielded a small quantity of B4H10. (Author)

AD-273 594 Div. 4, 25
(TISTM/TCG) OTS price $1.60

Aerospace Corp., Los Angeles, Calif.
THERMODYNAMIC AND TRANSPORT PROPERTIES OF RUBIDIUM VAPOR AND CESIUM VAPOR,
by Lawrence Baylor Robinson. 19 Dec 61, 15p. incl. illus. tables, 6 refs. (Rept. no. TDR-930(2220-50)TR-1)
(Contract AF 04(647)930)
(DCAS TR 61-28) Unclassified report

DESCRIPTORS: (Alkali metals, *Rubidium, *Cesium, Vapors, Theory, Thermodynamics, Transport properties, Mathematical analysis, Recombination reactions.) (Energy, Enthalpy, Specific heat.) Gases.

Thermodynamic and transport properties of Rb and Cs vapors are determined from theory, supplemented by experimental results. The situa-

tion for which results are obtained involves negligible ionization of the alkali atoms. The model used is an imperfect gas obeying the virial equation of state. The second virial coefficient is considered adequate to account for deviations from the ideal behavior in the temperature and pressure range under consideration. It is assumed that the vapors are comprised of alkali atoms whose interactions are the pairwise Lennard-Jones (6 - 12) type. On the basis of the 2 parameters which occur in the Lennard-Jones potential for interactions between some alkalis and noble gas atoms and the known parameters for the noble gas atoms, the parameters are estimated for the alkalis. From these parameters the desired thermodynamic and transport properties of Rb and Cs vapors are obtained. Numerical values are given for the important properties. (Author)

AD-273 601 Div. 4, 25, 26
(TISTM/EJH) OTS price $2.60

Metals and Ceramics Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
PROPERTIES AND STRUCTURE OF BORIDES (SELECTED ARTICLES),
Rept. on Refractory Inorganic Nonmetallic Materials,
tr. by F. W. Vahldiek and S. A. Mersol. Jan 62, 21p. incl. illus. tables, 13 refs.
(Proj. 7350)
(ASD TR 61-514) Unclassified report

DESCRIPTORS: (*Silicon compounds, *Metallic compounds, *Borides, Carbides, Nitrides, Powder metals, Crystal structure, Physical properties, Density, Chemical properties, Heat of formation, Sintering, Hydraulic presses.) (Silicon compounds, Titanium compounds, Chromium compounds, Borides.) Refractory materials, USSR.

Of the four translations included in this report, two concern SiB6, the X-ray determination of the SiB6 structure, and some problems on the chemical compounds involving boron and silicon. The third is a treatise on the heats of formation of the borides of some transition metals, with certain references to their carbides and nitrides. The fourth comprises a discussion of the pressing and sintering of TiB2 and CrB2 powders. (Author)

AD-273 723 Div. 4, 25, 14
(TISTM/EJH) OTS price $9.60

Plastics Lab., Princeton U., N. J.
SYNTHESIS AND CHARACTERIZATION OF SOME HIGHLY CONJUGATED SEMI-CONDUCTING POLYMERS,
by E. H. Engelhardt and H. A. Pohl. 1 Jan 62, 83p. incl. illus. tables, 54 refs. (Technical rept. no. 64A)
(Contracts DA 36-039-sc-89143 and DA 36-039-sc-78105, Proj. NR 356-375)
Unclassified report

DESCRIPTORS: (*Semiconductors, *Organic materials, *Organic compounds, *Polymers, Synthesis, Molecular structure, Conductivity, Resistance, Hall effect, Thermoelectricity, Photoconductivity, Electrons, Spin, Stability.) (Quinones, Anthracenes, Naphthalenes, Phenanthrenes, Benzenes, Ferrocenes, Aniline.)

A series of highly conjugated, semiconducting polymers was synthesized and electronically characterized. The conductivities of polymers, produced, ranged from approximately 1/10 to the 3rd power to 10 to the 11th power mho cm at room temperature. A correlation between conductivity in PAQR polymers, and the size of the aromatic hydrocarbon monomer, was established. Thermoelectric power measurements, and a Hall determination generally indicated p-type conductivity in the polymers. Additional electrical determinations included: Thermal activation energy of conduction, ohmic behavior, carrier species, electron spin density, thermal and chemical stability, and photo-electrical effects. The electronic nature of conduction in the polyacene quinone radical polymers was proven by observing a large (positive) Hall coefficient, and the stability of conduction to large charge passage. Nonohmic behavior was observed at low electric field strengths. (Author)

AD-273 732 Div. 4
(TISTM/GEC) OTS price $5.60

Research Inst., Temple U., Philadelphia, Pa.
ADDITION AND SUBSTITUTION PRODUCTS OF OXYGEN FLUORIDES.
Annual progress rept. no. 2, 1 Jan-31 Dec 61, by A. G. Streng and A. V. Grosse. 19 Jan 62, 49p. incl. illus. table, refs.
(Contract Nonr-308501)
Unclassified report

DESCRIPTORS: (*Oxyfluorides and *Chlorides, Synthesis from Oxyfluorides and Fluorides of Chlorine compounds, Bromine compounds, Sulfur compounds, Chemical reactions.) (Physical properties, Chemical properties, Solubility, Stability, Temperature, Electrical properties, Low temperature research, Ultraviolet spectroscopy.) Electric discharges.

A new type of highly colored deep-violet addition compounds of O2F2 was obtained. These compounds were formed by addition to ClF, BrF3 and SF4, under mild reaction conditions. They have a remarkable oxidizing power, even at very low temperatures. The O2F2 + ClF reaction was studied extensively. Various combinations of the factors influencing the synthesis were investigated, and the yield was raised to 81% of the theoretical value. The investigation of the properties of the compound, with an elementary composition of O2ClF3, showed that it was contaminated only by ClF3, and stable at 195 K. It was kept at this temperature for over 9 months without any noticeable decomposition. The compound was soluble in liquid ClF3, ClF, O2F2 and HF, at 125 to 190 K., but was insoluble in liquid O2, O3, ClO3F, C3F8, NF3, CCl2F2 and CClF3 in the range of 90 to 160 K. When dissolved in anhydrous HF at -78 C it did not act as an electrolyte. The compound reacted vigorously with NH3, C2H6 and C2H4, even at 120 to 160 K. (Author)

AD-273 733 Div. 4, 10
(TISTM/EJH) OTS price $1.60

Texaco Experiment Inc., Richmond, Va.
COMBUSTION OF ELEMENTAL BORON.
Quarterly summary rept., Nov 61-Jan 62, by U. V. Henderson, Jr. and Harry P. Woods. 1 Feb 62, 13p. incl. illus. tables, 5 refs.
(Rept. no. TM-1326; EXP 223)
(Contract Nonr-188300)
Unclassified report

DESCRIPTORS: (*Boron, *Combustion, Chemical reactions, Fluorine, *Oxidizers, Oxidation, Reaction kinetics, Boron compounds, Fluorides, Mass spectroscopy, Temperature, High temperature research.)

It was confirmed that BF is the species evolved from the surface of a heated B rod exposed to F

gas inside a mass spectrometer. Evidence indicated that the rate of formation of BF is only slightly dependent on temperature above 1200 K. Preliminary experiments in a microbalance apparatus show no detectable reaction between a high-purity polycrystalline B rod at ambient temperature and F gas at 1 to 200 micron Hg pressure. However, a B rod heated to about 600 K in an image furnace gives a reaction rate of about 10 to the 16th power molecules/sq cm-sec at a F pressure of 1 micron Hg. This value is subject to an upward revision since it corresponds to approximately total consumption of the F at the flow rates possible with the equipment. (Author)

AD-273 771 Div. 4, 25
(TISTP/TL) OTS price $1.60

Noyes Chemical Lab., U. of Illinois, Urbana.
ELECTRON COUPLING OF NUCLEAR SPINS. VI. RELATIVE SIGNS OF J_{gem}^{HH}, J_{g}^{HH}, AND J_{t}^{HH} IN (2.2) METACYCLOPHANE,
by H. S. Gutowsky and Cynthia Juan. 14 Mar 62, 15p. incl. illus. (Technical rept. no. 48)
(Contract Nonr-183413, Proj. NR 051-215)
Unclassified report

DESCRIPTORS: (*Electrons, Couplings of *Nuclear spins, *Protons.) (Nuclear magnetic resonance, Atomic orbitals, Molecules, Molecular spectroscopy, *Chemical bonds, Valence, Methanes, Hydrogen, *Polycyclic compounds.)

This analysis is concerned with the comparison between experiment and valence-bond calculations of the σ-electron contribution to the proton-proton coupling constants of CH_2 and HCCH groups in high resolution nmr spectra. Such calculations predicted the geminal coupling J_{gem}^{HH} to be +12.5 cps in methane, and subsequent, more approximate, calculations for the coupling of vicinal protons in the HCCH ethanic fragment with tetrahedral HCC bond angles gave the trans coupling J_{t}^{HH} to be about +9.2 cps and the gauche J_{g}^{HH}, + 1.7 cps. The magnitudes of these values agree well with experiment except that the trans vicinal constants observed for ethanic groups (and also both the cis and trans constants for ethylene) are often about 50% larger than predicted. (Author)

AD-273 844 Div. 4, 10
(TISTM/GEC) OTS price $7.60

Rocketdyne, Canoga Park, Calif.
RESEARCH IN FLUORINE CHEMISTRY.
Summary progress rept., 16 Mar 61-15 Mar 62, by H. H. Rogers and J. H. Johnson. 30 Mar 62, 63p. incl. illus. tables, 13 refs. (Rept. no. R-3505)
(Contract Nonr-181800)
Unclassified report

DESCRIPTORS: (*Liquid rocket propellants, *Rocket oxidizers, Electrochemistry, Synthesis.) (*Nitrogen compounds, *Oxyfluorides from Electrolysis of Fluorides, Hydrogen compounds, Nitrogen compounds, Tetroxides, Nitric acid.) (Electrodes, Platinum, Nickel, Electrolytic cells, Electric potential, Electrical conductance.)

The electrolysis of solutions of compounds containing N and O dissolved in anhydrous HF was initiated as a means of synthesizing N-O-F compounds. Data were presented on the HF-N_2O_4 system, particularly its electrical properties; information also was presented on electrode materials. Pt was a satisfactory reference electrode in anhydrous HF for monitoring changes in electrode potential during electrolysis. The electrolysis of HF-N_2O_4 and of HF-HNO_3 solutions near 0 C yielded substantial quantities of NO_3F and OF_2. This synthesis of NO_3F demonstrated for the first time that a compound containing the -NOF group can be prepared electrochemically. At -20 C, the electrolysis of HF-N_2O_4 yielded O_3 in addition to NO_3F and OF_2. The O_3 prepared by this method showed an unusual degree of stability toward explosive decomposition. The effect of additives and of changes in experimental conditions is discussed. The results of electrolysis on the HF-NO and HF-FNO systems are also presented. Data on the solubility of N_2O in HF are reported. (Author)

AD-273 856 Div. 4, 14
(TISTM/GEC) OTS price $4.60

Aerospace Corp., Los Angeles, Calif.
ENERGY CONVERSION. ELECTRICAL PROPERTIES OF ORGANIC COMPOUNDS.
Semiannual technical rept., 1 July-31 Dec 61, by H. H. Takimoto, P. C. Marx and others. 9 Feb 62, 36p. incl. illus. 26 refs. (Rept. no. TDR-930(2220-20)TR-1)
(Contract AF 04(647)930)
(DCAS TDR 62-19) Unclassified report

DESCRIPTORS: (*Organic compounds, *Semiconductors, Polymers, *Synthesis, Chemical reactions, *Quinones, *Cyano radicals, Phenyl radicals, Methanes, Oximes, Benzonitriles, Benzenes, Ethylenes, Hydroxides.) (Electrical properties, Electrical conductance, Photoelectric effect, Radiofrequency.)

A study was made to determine the mechanism of electronic conduction process in organic compounds to provide data for the development of new solid-state and energy-conversion concepts. Syntheses of structures related to 7,7,8,8-tetracyanoquinodimethane, whose derivatives were reported to exhibit extremely high conductivities, (.01 ohm/cm), as well as other polycyano and polyhydroxyaromatic compounds, were investigated. Electrical properties, such as conductivity, photoelectric effects, radio frequency loss angle, mobility, and lifetime of charge carriers, will be determined. It should be possible to deduce the nature of the electronic conduction process in organic compounds. (Author)

AD-273 881 Div. 4, 14
(TISTM/BRW) OTS price $1.60

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
PHASE TRANSFORMATIONS DURING OXIDATION-REDUCTION OF URANIUM OXIDES,
by V. N. Strekalovskiy, A. F. Bessonov and others. 27 Feb 62, 10p. incl. illus. 12 refs. (Trans. no. FTD-TT-62-107 of Fizika Metallov i Metallovedeniye 11:No. 3, pp. 400-403, 1961)
Unclassified report

DESCRIPTORS: (*Uranium compounds, Oxides, Oxidation-reduction reactions, Decomposition, *Phase transitions, Phase studies, X-ray diffraction analysis, Reaction kinetics.)
USSR.

Conclusions pertaining to phase transformations in the uranium-oxygen system, based on the kinetic investigations of the reduction and oxidation processes of uranium oxides supplemented by an X-ray diffraction study of the products obtained are presented. (Author)

5. COMMUNICATIONS

AD-273 486 Div. 5, 23
(TISTE/CDM) OTS price $14.00

General Electric Co., Syracuse, N. Y.
FEASIBILITY STUDY WIDE ANGLE TELEVISION DISPLAY,
by S. K. Altes and J. H. Chu. 14 Nov 56, reprinted 1 Feb 62, 191p. incl. illus. refs.
(Contract Nonr-192800)
(NAVTRADEVCEN 15U7-1)
Unclassified report

DESCRIPTORS: (*Television display systems, *Three dimensional display systems, Feasibility studies for *Training devices.) (Training from Simulation, Display systems, *Television equipment, Cathode ray tubes, Storage tubes, Optical systems.)

Results are described of a study of known approaches to generation and presentation of a non-programmed wide angle television display for presenting a synthetic real world environment to a trainee. Both feasible and non-feasible approaches were examined as well as unconventional means of obtaining a television picture such as dark trace tubes, storage tubes and rapid access intermediary systems. This study has shown that presently available materials, processes and techniques are not in themselves capable of generating a visual presentation of sufficient angle of view or adequate resolution and brightness for most wide angle training requirements. Recommendations for further work are made to overcome these limitations by techniques such as multiple pickup and projection units and the development of new tube types. (Author)

AD-273 546 Div. 5
(TISTB/AW) OTS price $10.50

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
THE MODERN ARMY COMMUNICATION SYSTEM.
Final rept. on People, Organizations and Communications. An Operations Research Study of Army Communication,
by Joel N. Bloom, Clifton E. Mayfield, and Richard Williams. Jan 62, 128p. incl. illus. 4 refs. (Rept. no. F-A2313)
(Contract DA 36-039-sc-78332)
Unclassified report

DESCRIPTORS: (*Operations research, *Communications theory, Military communications, Effectiveness, Measurement, Errors.) (Military organizations, Language, Intelligibility, Control.)

The effectiveness of the human and organizational elements in military communication systems was studied. The data are based on field measurement programs using over 2,500 actual communications from daily traffic at six U.S. Army headquarters. Additional data were secured from interview, questionnaire, and observation studies as well as from an experimental simulation. The analysis shows that current procedures generate appreciable delays and do not significantly control error. A plan for a new and improved system - the Modern Army Communication System (MACS) - is advanced and discussed. (Author)

AD-273 642 Div. 5, 8
(TISTE/CAM) OTS price $1.60

Aeronautical Electronic and Electrical Lab., Naval Air Development Center, Johnsville, Pa.
FEASIBILITY OF APPLYING THE LINEAR CLASS C POWER AMPLIFIER TO SINGLE SIDEBAND RADIO,
by L. Pelosi and M. Cobb. 13 Mar 62, 13p. incl. illus. (Rept. no. NADC-EL-61122)
(WEPTASK R360FR102/2021/R011-01-001)
Unclassified report

DESCRIPTORS: (*Radio communication systems, Sidebands, *Power amplifiers, Electron tubes, Airborne, Design, Linear systems, Model tests, Mathematical analysis.) (*Naval communications, *Radiofrequency amplifiers, Sidebands, Linear systems, Electrical networks, Tests.)

A breadboard model of a linear, class C, power amplifier was fabricated and tested, and its operation was analyzed to determine its possible application to Navy single-sideband communication systems. A tube was used in the circuit with a clamp tube connected from screen to ground. The results of the investigation indicated that the particular amplifier operated in the class B rather than the class C mode, and was not suitable for Navy application. (Author)

AD-273 682 Div. 5
(TISTE/CDM) OTS price $9.10

Bell Telephone Labs., Inc., Whippany, N. J.
UNICOM. UNIVERSAL INTEGRATED COMMUNICATION SYSTEM.
Quarterly progress rept. no. 10, vol. 1, 1 Oct-31 Dec 61.
31 Dec 61, 101p. incl. illus. tables.
(Contract DA 36-039-sc-78806, Proj. 3-55-00-200; In cooperation with ITT Labs., Nutley, N. J. and Radio Corp. of America, New York)
Unclassified report

DESCRIPTORS: (*Military communications, *Communication systems, Design, Data transmission systems, Voice communication systems, Secret communication systems, Teletype systems, Radio communication systems, Telephone communication systems, Facsimile communication systems.) (*Communication equipment, Electronic switches, *Switching circuits, Analog systems, Digital systems, Transmission.)

Work continued on Project Unicom. A report on the transmission facilities required for Unicom phase I (1965) was prepared. A study of 3 plans for signaling between subscriber stations and the switching center resulted in the choice of a plan utilizing the message channel for high-speed heading transfer. An initial maintenance and reliability guideline was issued. Objectives for the performance of digital models and specifications for digital terminating unit basic optional arrangements and features were included. Organization and requirements of major equipment design areas and design of the circuits for the test model were detailed. Functional specifications for the operational programs for the test model were completed. (Author)

Division 5 - COMMUNICATIONS

AD-273 683 Div. 5
(TISTE/CDM) OTS price $6.60

Bell Telephone Labs., Inc., Whippany, N. J.
UNICOM. UNIVERSAL INTEGRATED COMMUNICATION SYSTEM.
Quarterly progress rept. no. 10, vol. 2, 1 Oct-31 Dec 61.
31 Dec 61, 46p. incl. illus. tables.
(Contract DA 36-039-sc-78806, Proj. 3-55-00-200; In cooperation with ITT Labs., Nutley, N. J. and Radio Corp. of America, New York)
Unclassified report

DESCRIPTORS: (*Military communications, *Communication systems, Design, *Voice communication systems, *Telephone communication systems, Facsimile communication systems.) (*Communication equipment, Maintenance, Reliability, Facsimile transmission.) (Coding, Pulse modulation, Auditory signals.) *Panel boards (Electricity).

Contents:
Maintenance and reliability guideline for UNICOM, by D. R. Barney, G. F. Clement, C. W. Haas, and R. L. Simms, Jr.
Time required to frame a log-differential pulse code modulation system, by J. J. Horzepa
Present engineering plan for operating facsimile in the UNICOM network, by J. J. Horzepa
Organization of the switching center central processor program, by K. A. Heller
Traffic attendant console, design proposal, by R. F. Cook

AD-273 700 Div. 5, 12
(TISTW/EET) OTS price $1.60

ITT Kellogg, Chicago, Ill.
FIXED GROUND COMMUNICATION SYSTEMS. WEAPONS SYSTEM 107A-1.
Program progress rept. no. 58 for Feb 62.
Feb 62, 14p.
(Contracts AF 04(647)312, AF 04(647)461 and others)
Unclassified report

DESCRIPTORS: (*Guided missiles, Surface to surface, *Communication systems, *Communication equipment, Installation in Military facilities, Quality control, Scheduling, Ground support equipment.)

AD-273 764 Div. 5, 8
(TISTE/NTM) OTS price $2.60

Naval Radiological Defense Lab., San Francisco, Calif.
A METHOD OF INCREMENTAL RECORDING ON MAGNETIC TAPE,
by L. A. Perrine and H. A. Zagorites. 12 Feb 62, 23p. incl. illus. tables, 2 refs. (NRDL-TR-548)
Unclassified report

DESCRIPTORS: (*Magnetic recording systems, *Magnetic tape, Recording devices, Miniature electronic equipment, Transistors, Design, Tests, Test methods.) *Data storage systems.

The conventional method of recording pulse data on magnetic tape fails to fully utilize the optimum bit-packing capability of the recording tape at pulse rates less than the design maximum. A simple method of incremental recording is described wherein the tape is stepped one increment of length for each serial input pulse, allowing optimum bit packing which is independent of pulse rate. The method is applicable to multi-channel recording of variable pulse rates up to 100 pps and to recording mediums other than magnetic tape. It is advantageous where low power drain and long recording time without tape reloading are required. An experimental miniature incremental magnetic tape recorder, utilizing a commercially available stepping motor and having transistorized logic and drive circuitry is described. Test results are given and a method of data analysis for incrementally recorded tape by means of conventional playback is presented. (Author)

AD-273 778 Div. 5, 8
(TISTE/NTM) OTS price $9.10

National Bureau of Standards, Boulder, Colo.
EVALUATION OF AURORAL PROPAGATION FACTORS: TRANSMISSION LOSS PHASE. PART I. SYSTEM-LOSS BEHAVIOR AND PREDICTION ON SOME HIGH-FREQUENCY ARCTIC PATHS,
by R. Silberstein. 15 Feb 62, 1v. incl. illus. tables, 18 refs. (NBS Rept. no. 6742)
Unclassified report

DESCRIPTORS: (*Radio waves, High frequency, Very high frequency, *Radio transmission, Absorption, Attenuation, Propagation, Ionospheric propagation.) (*Aurorae, Ionosphere, Arctic regions, Radio communication systems, Reliability, Errors.)

Studies of high-frequency transmission loss were made on a propagation path along the auroral zone, across the auroral zone and across part of the Polar Cap and curves of its diurnal behavior were drawn. Attempts made to obtain correction factors to apply to predictions of transmission loss by standard methods for non-auroral paths gave results for the cases studied but revealed great difficulty of interpretation because of lack of knowledge of moding and insufficiently precise knowledge of such parameters as equivalent reflection height. Studies of transmission loss during disturbances showed a variety of effects. The effect of proton events upon a Polar Cap path were not as conspicuous as might be expected, partially because they occurred at times when auroral disturbances spread over the Cap. (Author)

AD-273 870 Div. 5, 12
(TISTE/NTM) OTS price $11.50

ITT Labs., Federal Labs., Nutley, N. J.
PASSIVE SPHERICAL SATELLITE COMMUNICATIONS STUDY. Final rept.,
by John V. Wilding, Howard S. Margetts and others. Mar 62, 152p. incl. illus.
(Contract AF 30(602)2211, Proj. 4519)
(RADC TDR 62-89) Unclassified report

DESCRIPTORS: (*Air force communications, *Radio relay stations, *Radio relay systems, *Satellite vehicles, *Radio communication systems, *Data transmission systems, Facsimile communication systems, *Voice communication systems, Radio receivers, Teletype systems.) (Communication systems, *Digital systems, Analog to digital converters, Data storage systems, Data processing systems.) Radio signals, Reflections.

The terminal equipment specifications presented provide the traffic handling capabilities for ground stations operating within a proposed passive satellite communications network. These stations will vary in size, depending upon the amount of traffic flow and the number of links served. The nature of the transmission medium poses several problems, including: a variable length transmission path, an instant of transfer

of communications from a setting satellite to a rising satellite, and the handling of traffic in the several forms of voice, graphics, teletype, and data. It is proposed that all traffic be handled in digital form once it enters the system and that transmission on each link be in the form of a time-division multiplexed serial binary stream. To correct for the variable length transmission path, the bit train is reclocked at the receiving end of each link. At the ground station, traffic is separated into real-time (voice and graphics) and store-and-forward (data and teletype). The two forms are processed through separate switching centers and recombined for transmission on the next link. Equipment is specified and cost estimates are given. (Author)

AD-273 898 Div. 5, 8, 30
(TISTW/DLW) OTS price $7.60

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta.
ENGINEERING INVESTIGATION AND STUDY OF AUTOMATIC VOICE INTELLIGIBILITY COMPUTATION METHODS.
Final rept.,
by D. W. Robertson and C. W. Stuckey.
1 Feb 62, 70p. incl. illus. tables, 18 refs.
(Contract AF 30(602)2150, Proj. A-483)
(RADC TR 62-95) Unclassified report

DESCRIPTORS: (*Voice communication systems, *Speech transmission, Radio communication systems, Radio interference, Interference, Signal-to-noise ratio, *Speech, Intelligibility, *Test sets, Automatic, Monitors, Design.) (Radio interference analyzers, Effectiveness, Tests.)

A technique is described for electronically determining the degradation in intelligibility that occurs when speech is corrupted by added noise. Primary attention is given to the extraction of the relative time positions of the speech waveform zero crossings, the computation of bivariate correlation coefficients from the zero crossings, and the comparison of the coefficients with articulation scores at various S/N ratios. Although the quantity of experimental data is limited, the results of the investigation indicate that the technique is useful in providing a measure of intelligibility comparable to that obtained by a listening team. (Author)

6. DETECTION

AD-273 522 Div. 6, 8
(TISTE/CDM) OTS price $7.60

Defense Research Lab., U. of Texas, Austin.
THE DETERMINATION OF FARFIELD CHARACTERISTICS OF LARGE, LOW-FREQUENCY TRANSDUCERS FROM NEAR-FIELD MEASUREMENTS,
by D. D. Baker. 15 Mar 62, 58p. illus. 9 refs.
(DRL Acoustical rept. no. 196)
(Contract NObsr-72627)
Unclassified report

DESCRIPTORS: (Sonar, *Antenna radiation patterns, Very low frequency, *Transducers, Calibration, Tests, Measurement in Water tunnels, Test facilities.) (Antisubmarine warfare, *Sonar equipment, Scanning sonar, Direction finding, Pressure, Phase measurement, Determination.) *Electroacoustic transducers.

The theory was developed for the computation of directivity patterns and source levels of a transducer from nearfield pressure amplitude and phase data. Preliminary work with 4 types of transducers in open water showed good agreement between measured and computed patterns. Extensive work was done with an AN/SQS-4 Mod 3 transducer and agreement between measured and computed patterns has been as good as ±1 db in the more recent work. This includes measurements made in open water and in a highly reflective tank. Tank measurements were made near the leading edge of the received pulse; that is, before reflections from the tank walls could interfere. The tank diameter was only 2.9 times that of the transducer. In several cases source level was computed with the patterns and proved to be within ±1 db of measured values in each case. Some work was done on a simplified nearfield test for large low-frequency transducers. (Author)

AD-273 549 Div. 6, 22
(TISTW/RD) OTS price $18.50

Goodyear Aircraft Corp., Akron, Ohio.
EXPERIMENTAL RESOLUTION IMPROVEMENT RESEARCH.
Final rept.,
by D. G. Corbett. 16 Mar 62, 1v. incl. illus. tables, 4 refs. (Rept. no. GER-10516)
(Contract DA 44-009-eng-4733, Proj. 8F07-11-001-01)
Unclassified report

DESCRIPTORS: (*Optical filters for improving Resolution of Light pulses from *Mine detectors, *Magnetic detectors.) (Mines, Detection.) Correlation techniques, Mathematical analysis, Transformations (Mathematics), Sampling.

A procedure for improving resolution by 2-dimensional inverse filtering of optical signals is described along with a method of computing a suitable filter for this process with a convolution equation system using space-domain Dirac samples of the sensor aperture. Results of an investigation of other methods of defining the required filter are also presented. The fabrication of density patterns to represent a mine detector aperture, distorted scene, and a resolution improvement filter and their use in a successful demonstration of this concept for resolution improvement is described. The response pattern and linearity of a magnetic-induction mine detector with several different coil configurations were studied, and their applicability to the resolution improvement process is discussed. (Author)

AD-273 584 Div. 6, 26, 14
(TISTM/GEC) OTS price $3.60

Shenango China, Inc., New Castle, Pa.
DEVELOPMENT OF MANUFACTURING METHODS FOR THE PRODUCTION OF ALUMINA RADOMES.
Final rept.,
by W. David Spore. 31 Aug 61, 36p. incl. illus.
(Contract NOa(s) 59-4148-c)
Unclassified report

DESCRIPTORS: (*Radomes, Ceramic materials, *Aluminum compounds, *Oxides, Manufacturing methods, Processing, Molding, Casting, Heat treatment, Industrial equipment, Hydraulic presses.) (Physical properties, Electrical properties.)

A study was made to develop manufacturing methods and procedures for the production of ceramic alumina radomes, without grinding any surface by the mating thread ring surface. Ten radomes were furnished for evaluation. (Author)

Division 6 - DETECTION

AD-273 612 Div. 6, 2, 8
(TISTW/DLW) OTS price $2.60

Barnes Engineering Co., Stamford, Conn.
MEASUREMENT OF ATMOSPHERIC ATTENUATION ABOARD USAS AMERICAN MARINER.
Progress rept. on Infra-Red and Electro-Optics, by H. R. Byck. 12 Mar 62, 20p. incl. illus.
(Contract DA 19-020-ORD-5372)
Unclassified report

DESCRIPTORS: (Re-entry vehicles, *Optical tracking, *Infrared tracking, Shipborne.) (*Atmosphere, Sky brightness, Solar energy, Blackbody radiation, Density, Absorption, Scattering, *Attenuation, *Wave transmission, Measurement, Optical analysis.) (Atmosphere models, Instrumentation.) *Guided missile tracking systems.

In the course of the analysis of optical measurements obtained on reentry studies made from USAS AMERICAN MARINER, a knowledge of the atmospheric attenuation between the reentry event and the observer is necessary. The problem of atmospheric effects on the observation of a reentry event entails a knowledge of the transmission of the entire atmosphere at different elevation angles and is hence almost identical to the atmospheric transmission problem faced by astronomers. The problem was to measure the effect of elevation angle on the flux density incident at the observer. The relation between air mass and elevation angle assumes a planar atmosphere and is good down to elevation angles of 5 degrees or so. The air mass at an angle of 90 degrees (overhead) is defined as air mass 1. By the compilation of extensive data in the nominal reentry area, an atmospheric model is under development which will permit, in the absence of specific measurements, correction for atmospheric attenuation to an expected accuracy of ± 20%. (Author)

AD-273 639 Div. 6
(TISTW/RD) OTS price $5.60

Litton Systems, Inc., Waltham, Mass.
ACOUSTIC SIGNAL DETECTION BY SIMPLE CORRELATORS IN THE PRESENCE OF NONGAUSSIAN NOISE. I. SIGNAL TO NOISE RATIOS AND CANONICAL FORMS,
by David Middleton. 15 Feb 62, 48p. incl. illus. refs. (Technical rept. no. TR-62-1-BF)
(Contract Nonr-332000)
Unclassified report

DESCRIPTORS: (*Detection of *Sonar signals, *Underwater sound signals, *Underwater sound in presence of Noise using Correlation techniques.) Signal-to-noise ratio, Acoustics, Acoustic detectors, Fourier analysis, Integral transforms.

The detection of underwater acoustic signals by simple auto- and cross-correlation receivers in the presence of non-normal, as well as normal background noise is examined on the basis of signal-to-noise ratios calculated from a generalized deflection criterion. Particular attention is devoted to the effects of impulse noise and mixtures of impulse and normal noise on system performance. Comparisons between system behavior vis-a-vis the 2 types of interference are made. For impulse noise equivalent in spectral distribution and av intensity to a gauss noise background, it is found that the output signal-to-noise (power) ratios are related by a canonical expression. (Author)

AD-273 696 Div. 6
(TISTB/LH) OTS price $3.60

Human Engineering Labs., Aberdeen Proving Ground, Md.
HELICOPTER ARMAMENT PROGRAM. AIR-TO-GROUND TARGET DETECTION AND IDENTIFICATION,
by Calvin G. Moler. Jan 62, 33p. incl. illus. tables (Technical memo. no. 1-62)
Unclassified report

DESCRIPTORS: (*Targets, *Detection, Identification, Air to surface.) (*Helicopters, Target recognition, Optical target designators, Pilots, Aviation personnel.)

An investigation of the susceptibility of typical stationary ground targets to detection, identification, and slant range estimation from helicopters flying contour was conducted. Thirty-two rated pilots acting as observers were flown over an area containing nine of each of five target types. Targets were randomly distributed throughout the area and defensively emplaced. Subjects did not know the location of any of the targets and were required to continually search while being flown through the area on a predetermined course. The maximum range at which any target was detected was 1400 yards. The largest number of detections for each target occurred at a range no greater than 300 yards. Of the five types used, the tank (M-48) was most often detected. Detection probability for this study was found to be 0.38. (Author)

AD-273 742 Div. 6, 30
(TISTW/DLW) OTS price $9.10

Airborne Instruments Lab., Inc., Deer Park, Long Island, N. Y.
ANALYSIS OF PERFORMANCE OF ATC RADAR BEACON SYSTEM IN SATIN,
by A. Ashley and L. G. Cole. Mar 60, 108p. incl. illus. tables (Rept. no. 8421-1)
(Contract FAA/BRD-266)
Unclassified report

DESCRIPTORS: (*Air traffic control systems, *Civil aviation, *Radar navigation, *Radar beacons, Automatic, *Radar tracking, Radar signals, *Data processing systems, Coding, Display systems, Effectiveness, Analysis.) (Aerial targets, Flight paths, Radar tracking, Identification systems, Position finding, Reliability.)

The Federal Aviation Agency is investigating the use of the SAGE air defense system for en-route air-traffic control. The program of SAGE air traffic integration and the experimental system used in this program is known as SATIN. A beacon code-usage plan that provides for display filtering in both manual and automatic systems is developed. The performance of the AN/FST-2 as a beacon data processor is analyzed. The performance includes target detection, release, center marking, and code readout. Deficiencies in code-readout performance are indicated and possible remedies are suggested. The code-processing performance of the AN/FSQ-7 is analyzed and determined to be adequate when the AN/FST-2 deficiencies are corrected. (Author)

AD-273 813 Div. 6, 12
(TISTA/LSK) OTS price $3.60

General Electric Co., Santa Barbara, Calif.
THE J P L DEEP SPACE INSTRUMENTATION FACILITY

(DSIF),
by D. R. Speece. 15 Oct 61, 34p. incl. illus. tables (Rept. no. 61 SPC-5)
Unclassified report

DESCRIPTORS: (Spaceships, Space probes, Lunar probes, Space flight, *Radar tracking, Guided missile tracking systems, Radio astronomy, *Doppler tracking, Doppler systems, Command systems, Telemeter systems, Communication systems, Data processing systems, Instrumentation, *Radar stations.)

An integral requirement in the conduct of scientific investigations of outer space is the establishment of a precision tracking and communications system capable of providing command, telemetering, and positional tracking of the space probe. The Deep Space Instrumentation Facility (DSIF) has been established to satisfy this requirement in lunar and planetary programs. The DSIF is comprised of 3 Deep Space Stations (DSS's), a mobile station, and the intersite communication links providing for transfer of data and for administration of operations by JPL. The DSS's are presently equipped with 85 ft diameter reflectors, and can track at angular rates to 1 deg/sec. These large reflectors are used mainly for deep-space experiments. The mobile station is equipped with a 10 ft diameter reflector, and can track at angular rates to 10 deg/sec. The mobile station is used mainly for command, telemetering, and tracking of space probes from injection to about 10,000 mi altitude. The design philosophy of the DSIF is to provide a precision radio-tracking system which measures two angles, radial velocity and range, and then to utilize this tracking system to send radio commands and to receive radio telemetry in an efficient and reliable manner. (Author)

7. ELECTRICAL EQUIPMENT

AD-273 481 Div. 7, 14
(TISTM/GEC) OTS price $2.25

Armour Research Foundation, Chicago, Ill.
SEAL AND INSULATOR PROBLEMS IN THERMIONIC CONVERTERS.
Summary rept., 15 Feb 61-15 Feb 62.
12 Mar 62, 82p. incl. illus. tables, 44 refs.
(Rept. no. ARF 2215-6)
(Contract Nonr-344100, Proj. NR 099 354)
Unclassified report

DESCRIPTORS: (*Power supplies, *Thermionic emission, Seals, Electric insulation, Ceramic materials, Refractory materials, Metallic compounds, Oxides, Boron compounds, Nitrides, Zirconium compounds, Silicates.) (Physical properties, Density, Mechanical properties, Electrical properties, Resistance, Thermodynamics, Neutron cross sections, Neutron capture, Thermal conductivity, Stability.) Bibliography.

A discussion of the materials requirements for seals and insulators for thermionic energy converters is presented. Based on the requirements and published physical property data, Al203 appeared to be the most desirable insulator material at temperatures below its melting point. The study includes a discussion of metal ceramic sealing technology and a bibliography of publications in the field covering 1959, 1960, and part of 1961. The insulator was required to possess a reasonable value of electrical resistivity at temperatures which may reach as high as 2000 K and the specific resistivity of candidate oxides was required to be as high above 100 ohm-cm as possible at any temperature at which it is to function. The thermal conductivity of the insulator was less important than the electrical conductivity but low thermal conductivity was desirable. The insulator-seal combination must be stable in the presence of fission products and have a low capture cross section for slow and fast neutrons. It must be a dense material with reliable physical and mechanical properties. (Author)

AD-273 551 Div. 7, 25
(TISTP/TL) OTS price $5.60

Goodyear Aircraft Corp., Akron, Ohio.
SOLAR ORIENTING DEVICE FOR EXPANDABLE FLAT-PANEL ARRAY.
Quarterly progress rept. no. 2, 1 Oct-31 Dec 61, by G. J. McKeel. 26 Jan 62, 52p. incl. illus. (Rept. no. GER-10553)
(Contract DA 36-039-sc-88913)
Unclassified report

DESCRIPTORS: (*Solar cells for *Electric power production, Thermal radiation, Solar energy.) (Sun, Tracking, Focusing, Detection.) (Rotating structures, Design, Sensitivity, Tests.) (Power supplies, Feasibility studies.)

The effects of solar declination change on the total angular error of the array and the position for mounting the sun sensor are treated. Curves of total angular error versus declination change for various values of the tracking drive error are presented. An example is outlined for calculating the possible period of unattended operation of the solar orienting device and its array for a particular set of initial conditions which contain a constant declination value. The tracking rate for the array is examined to obtain an insight into some of the important parameters affecting its operation. The requirements for automatic declination control applicable to the solar orienting device were examined, and a feasible approach to the sensor is presented. A circuit diagram illustrates the additional hardware needed for two-axis automatic control. Sensor modification is discussed for the purpose of removing the dead zone which, under certain tracking conditions, can occur. Experimental results gained from the breadboard model of the mount and drive unit are given, and the sun sensor accuracy is also obtained. Photographs of the breadboard mount and sun sensor are included. (Author)

AD-273 556 Div. 7
(TISTE/CDM) OTS price $8.60

Kaye, Joseph, and Co., Inc., Cambridge, Mass.
SURVEY OF LONG LIFE SYSTEMS FOR GENERATION OF ELECTRICITY AT LOW POWER IN A MARINE ENVIRONMENT. VOLUME I.
31 Aug 60, 1v. incl. illus. tables, 8 refs.
(Rept. no. 33, vol. 1)
(Contract NObs-78711)
Unclassified report

DESCRIPTORS: (*Power supplies, *Electric power production, Direct current, Electronic equipment, Electrical equipment for Floating bodies in the Oceans.) (Fuel cells, Dry cells, Storage batteries, Thermoelectricity, Liquefied gases, *Generators, Internal combustion engines, Costs, Reliability, Design for Naval equipment.)

Division 7 - ELECTRICAL EQUIPMENT

A survey was made of long life systems for producing small quantities of electrical power for use in an oceanic environment. A description is given of the power-system requirements, and useful sources of energy for systems producing 2 watts for 2 years and 5 watts for 2 years are discussed. Included is a description of energy-conversion methods, a discussion of the use of the system concept in considering the power systems, and the presentation and illustration of an energy-conversion matrix. A basis for selection of attractive power systems is presented, followed by the detailed analyses of the 6 most attractive systems. The power-conversion systems considered are comprised of an energy source such as fuel and oxidant, energy-conversion devices, necessary control system, storage tanks for the energy source, and the container to house and protect the system. Finally, the characteristics, such as weight, volume and cost of these systems are compared. (Author)

AD-273 557 Div. 7
(TISTE/CDM) OTS price $7.60

Kaye, Joseph, and Co., Inc., Cambridge, Mass.
SURVEY OF LONG LIFE SYSTEMS FOR GENERATION OF ELECTRICITY AT LOW POWER IN A MARINE ENVIRONMENT. VOLUME II.
21 Nov 60, 69p. incl. illus. tables, 5 refs.
(Rept. no. 33, vol. 2)
(Contract NObs-78711)
Unclassified report

DESCRIPTORS: (*Power supplies, *Electric power production, Direct current, Electronic equipment, Electrical equipment for Floating bodies in the Oceans.) Primary batteries, Storage batteries, Sea water batteries, Fuel cells, Magnetohydrodynamics, Solid state physics, Solar energy, Thermoelectricity, *Generators.

A survey was made of long-life systems for producing small quantities of electrical power for use in an oceanic environment. Those systems and concepts which proved to be either completely impractical for the intended application, or which required further research or technical development, are briefly discussed. These latter systems and concepts must be examined in more detail than was permitted here before their attractiveness for future development can be determined. Batteries or galvanic devices, mechanical devices, thermomechanical devices, direct conversion devices, fuel cells, solid state devices, terrestrial devices, and solar devices are discussed. (Author)

AD-273 656 Div. 7
(TISTE/NTM) OTS price $4.60

Westinghouse Electric Corp., Pittsburgh, Pa.
BACK PACK PORTABLE THERMOELECTRIC GENERATOR. Final rept.,
by W. C. Moreland, J. C. Kastovich, and D. A. Forejt. Dec 61, 43p. incl. illus. tables.
(Contract NObs-78197)
Unclassified report

DESCRIPTORS: (*Generators, *Thermoelectricity, Design.) Heat transfer, Heat exchangers, Cooling, Thermocouples, Thermal conductivity, Electrical properties, Electric power production, Power supplies, Fuel systems, Tests, Test methods.

The development of a light-weight, portable thermoelectric generator is described. One of the basic features of the design is the direct connection of the heat exchangers to the thermoelectric elements. This reduced the cold side temperature drops to a negligible amount. A second basic design feature is the use of forced convective cooling. This type of cooling is necessary to handle the high heat fluxes that a unit of this type must utilize if weight is to be kept to a minimum. Another basic feature is the high packing factor or small spacing between thermocouples which is used. This was done so that the lowest contact resistance could be obtained for a given thermal flux. Another important feature is the interchangeability of gasoline and propane burners. The actual specific power of the generator is 7.5 w/lb. Tests indicated that thermocouples can be constructed that will operate in air with hot junction temperatures of 450 C for 1000 hrs or longer, making possible the construction of unsealed thermoelectric generators for military portable power source applications.

AD-273 662 Div. 7, 4
(TISTM/GEC) OTS price $1.60

Stanford Research Inst., Menlo Park, Calif.
THE EFFECT OF CONCENTRATED LIGHT ON PHOTOCHEMICAL ENERGY CONVERSION BY NITROSYL CHLORIDE SOLUTIONS, by Rudolph J. Marcus and Franklin M. Church.
7 Feb 62, 16p. incl. illus. tables, 11 refs.
(Scientific rept. no. 3; Rept. no. 9)
(Contract AF 19(604)7302)
(AFCRL 62-256) Unclassified report

DESCRIPTORS: (Solar furnaces, Photochemistry, *Photochemical reactions, Photolysis, Chlorine, *Oxychlorides, *Nitrogen compounds, Oxides, Light, Solar energy, Carbon tetrachloride.) (*Solar cells, Power supplies.) Recombination reactions.

Experiments on the photolysis of nitrosyl chloride in CCl4 solution with unconcentrated sunlight showed that quantum yields and amount of energy stored with unconcentrated light were only 1/10 of that stored with concentrated light. Therefore, it has been shown that concentrated light considerably increases the output of a photochemical reaction. The results obtained with unconcentrated sunlight may be expressed in terms of the photodissociation of nitrosyl chloride and of the recombination of the photoproducts, NO and Cl. The pressure rise upon exposure to light rapidly approached a steady state. The location of the steady state was governed by the speed of the back reaction. Once the steady state is established, the gas is generated only as fast as it is consumed by the back reaction. On the other hand, if the gas were withdrawn continuously to feed a nitrosyl chloride fuel cell, the steady state would be upset and the gas would be generated at the rate at which it is generated in the approach to the steady state in our experiments. (Author)

AD-273 676 Div. 7, 14, 17, 12
(TISTB/AW) OTS price $11.50

Aerospace Corp., El Segundo, Calif.
APPLIED RESEARCH MANAGEMENT ABSTRACT BULLETIN. PART I. ABSTRACTS 1-449 THROUGH 1-636.
Sep 61, 1v. (Rept. no. TDR-930(2701-01)TN-1,

pt. 1, no. 3)
(Contract AF 04(647)930)
Unclassified report

DESCRIPTORS: (*Bibliography, *Power supplies, Indexes, Auxiliary power plants, Alkaline cells, Dry cells, Guided missile batteries, Fuel cells, Storage batteries, Solar cells, Solar energy, Magnetohydrodynamics, Generators, Thermoelectricity, Spaceships, Thermionic emission, Thermopiles, Lubricants, Greases, High temperature research.) (Gas generating systems, Servo systems.) (Titanium alloys, Rolling mills.) (Steel, Extrusion, Mechanical properties.) (Airframes, Stainless steel.) (Titanium tubing, Niobium alloys, Beryllium.) (Refractory coatings, Plastics, Reinforcing materials.)

AD-273 677 Div. 7, 14, 17, 12
(TISTB/AW) OTS price $10.50

Aerospace Corp., El Segundo, Calif.
APPLIED RESEARCH MANAGEMENT ABSTRACT BULLETIN. PART I. ABSTRACTS 1-961 THROUGH 1-1103.
Nov 61, 1v. (Rept. no. TDR-930(2701-01)TN-1, pt. 1, no. 5)
(Contract AF 04(647)930)
Unclassified report

DESCRIPTORS: (*Bibliography, *Power supplies, Indexes, Auxiliary power plants, Alkaline cells, Dry cells, Guided missile batteries, Fuel cells, Storage batteries, Magnetohydrodynamics, Generators, Thermoelectricity, Spaceships, Solar cells, Solar energy, Thermionic emission, Thermopiles, Lubricants, High temperature research, Greases.) (Gas generating systems, Servo systems.) (Titanium alloys, Rolling mills.) (Steel, Extrusion, Mechanical properties.) (Airframes, Stainless steel.) (Titanium tubing, Niobium alloys, Beryllium.) (Refractory coatings, Plastics, Reinforcing materials.)

AD-273 678 Div. 7, 14, 17, 12
(TISTB/AW) OTS price $8.60

Aerospace Corp., El Segundo, Calif.
APPLIED RESEARCH MANAGEMENT ABSTRACT BULLETIN. PART I. ABSTRACTS 1-1104 THROUGH 1-1202.
Dec 61, 1v. (Rept. no. TDR-930(2701-01)TN-1, pt. 1, no. 6)
(Contract AF 04(647)930)
Unclassified report

DESCRIPTORS: (*Bibliography, *Power supplies, Indexes, Auxiliary power plants, Alkaline cells, Dry cells, Guided missile batteries, Fuel cells, Storage batteries, Magnetohydrodynamics, Generators, Spaceships, Solar cells, Solar energy, Thermionic emission, Thermoelectricity, Thermopiles, Lubricants, High temperature research, Greases.) (Gas generating systems, Servo systems.) (Titanium alloys, Rolling mills.) (Steel, Extrusion, Mechanical properties.) (Airframes, Stainless steel.) (Titanium tubing, Niobium alloys, Beryllium.) (Plastics, Reinforcing materials.) Refractory coatings.

AD-273 679 Div. 7, 14, 17, 12
(TISTB/AW) OTS price $9.60

Aerospace Corp., El Segundo, Calif.
APPLIED RESEARCH MANAGEMENT ABSTRACT BULLETIN. PART I. ABSTRACTS 1-1203 THROUGH 1-1325, by K. B. Andrews, N. B. Crow and others. Jan 62, 1v. (Rept. no. TDR-930(2701-01)TN-1, pt. 1, no. 7)
(Contract AF 04(647)930)
Unclassified report

DESCRIPTORS: (*Bibliography, *Power supplies, Indexes, Auxiliary power plants, Alkaline cells, Dry cells, Guided missile batteries, Fuel cells, Storage batteries, Magnetohydrodynamics, Generators, Spaceships, Solar cells, Solar energy, Thermionic emission, Thermoelectricity, Thermopiles, Lubricants, High temperature research, Greases.) (Gas generating systems, Servo systems.) (Titanium alloys, Rolling mills.) (Steel, Extrusion, Mechanical properties.) (Airframes, Stainless steel.) (Titanium tubing, Niobium alloys, Beryllium.) (Refractory coatings, Plastics, Reinforcing materials.)

AD-273 688 Div. 7
(TISTE/CDM) OTS price $9.60

Inland Testing Labs., Dayton, Ohio.
ALKALINE BATTERY EVALUATION.
Semi-annual rept. no. 2, 30 June 60-15 Oct 61, by I. F. Luke, W. G. Ingling, and W. W. Clark. Jan 62, 102p. incl. illus. tables, 5 refs.
(Contract AF 33(616)7529, Proj. 3145)
(ASD TDR 62-68; Supersedes Technical rept. no. 61-236, AD-267 051) Unclassified report

DESCRIPTORS: (*Alkaline batteries, Life expectancy, Electrical properties, Tests, Test facilities, Instrumentation.) (Spaceships, Satellite vehicles, Electrical equipment, Power supplies, Design.)

Tests were conducted on alkaline batteries to establish a broad base of battery test data for use in the design of the electrical system of future space vehicles and to determine the actual failure mechanism of all new battery systems under varying environmental and cycle-life conditions, so that improved space batteries can be developed. Techniques and/or materials were considered which could prevent these failures while at the same time increase the usable watt-hours-per-pound capability and cycle life of the battery. Cycle-life tests were conducted on one type of 12 ampere-hour, sealed nickel-cadmium cells in 4 temperature environments and 4 depths of discharge, in groups of 10 cells and in batteries of 20 cells. Initial results in the program show that: (1) cell cycle-life with shallow discharges is considerably longer than cycle-life at deep discharges; and (2) cycle-life is reduced by high and low ambient temperatures. (Author)

AD-273 702 Div. 7, 4
(TISTM/EJH) OTS price $5.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
BASIC STUDIES ON FUEL CELL SYSTEMS.
Quarterly rept. no. 3, 3 Nov 61-12 Feb 62, by A. B. Campa, M. Chin and others. 12 Feb 62, 43p. incl. illus. tables, 13 refs. (Rept. no. 2-99-62-1)
(Contract NOw 60-0738-d)
Unclassified report

DESCRIPTORS: (*Fuel cells, *Alkaline cells, *Electrolytic cells, Fuels, Hydrazines, Formaldehyde, Ammonia, Nickel electrodes, Platinum, Anodes (Electrolytic cell), Cathodes (Electrolytic cell), Electrochemistry, Design.) Primary batteries, Storage batteries.

The alkaline, aqueous N_2H_4, NH_3 and CH_2O anodes, and the intermediate NH_3-O fuel cell system were evaluated. Preliminary results were obtained with alkaline O and air cathodes. The most feasible systems were the aqueous N_2H_4 and the aqueous NH_3-O or air fuel cells. Evidence that N_2H_4 is anodically oxidized through H as an intermediate in alkaline electrolyte was obtained. Reduction of the surface area of the N_2H_4 black Pt anode catalyst was investigated for possible optimization with respect to N_2H_4 decomposition rate and anode polarization. N_2H_4 anode gases were analyzed at closed and open circuits. N_2H_4 was consumed at the cathode in multiple-cell fuel cells. The molten caustic NH_3 anode oxidized NH_3 to nitrate and nitrite at 150 C. The black Pt CH_2O anode had poor life in alkaline electrolyte. (Author)

AD-273 734 Div. 7, 30
(TISTP/WH) OTS price $1.10

David Taylor Model Basin, Washington, D. C.
TABLES FOR RAPID DETERMINATION OF DAMPING AND NATURAL FREQUENCY OF A LINEAR SYSTEM,
by Stewart A. Denenberg. Jan 62, 9p. incl. table (Rept. no. 1597)
Unclassified report

DESCRIPTORS: (*Galvanometers, *Damping of Vibration.) (Frequency of Vibration, Linear systems.) (Tables, Vibration, Frequency.)

A method is presented for rapid calculation of the damping and natural frequency of a galvanometer or any other linear, damped, one-degree-of-freedom system. Two equations are derived which relate the steady-state amplitude of response to the natural frequency and the damping. The solutions to these equations for a useful range of measured amplitudes are presented in tabular form. The technique involves measurements of steady-state amplitude of response at two different frequencies and is accurate to within two percent. (Author)

AD-273 807 Div. 7, 25
(TISTW/RD) OTS price $4.60

Eagle-Picher Research Labs., Miami, Okla.
INVESTIGATION OF INTEGRALLY COMPOSED VARIABLE ENERGY GAP PHOTOVOLTAIC SOLAR ENERGY CONVERTER.
Final technical summary rept., 9 Feb 61-9 Feb 62, by L. E. Stone, G. N. Webb, and K. E. Bean. 10 Feb 62, 39p. incl. illus. tables, 4 refs.
(Contract DA 36-039-sc-87408)
Unclassified report

Original contains color plates; all ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: (*Photoelectric cells, *Solar cells, Gallium compounds, Arsenides, Phosphides, Manufacturing methods, Diffusion.) *Electric power production, Power supplies, Solar energy, Thermoelectricity.

It is stated that the compound structure gallium phosphide-gallium arsenide, with intermediate thin transition regions, is produced by solid state diffusion of phosphorus into gallium arsenide at phosphorus pressures in excess of 8 atmospheres. The diffusion-conversion rate of gallium phosphide formation is pressure- and temperature-sensitive, is initially more rapid by orders of magnitude than classic phosphorus diffusion, and is extremely nonlinear. Significant depth differences between the polished and unpolished side of the same wafer were observed. The diffusion rate of zinc into gallium phosphide-gallium arsenide alloys of high gallium phosphide content is significantly faster than in gallium arsenide, and is estimated greater by several orders of magnitude. The window effect of the higher band gap layer is valid, and demonstrated by spectral response data. (Author)

AD-273 869 Div. 7
(TISTE/CAM) OTS price $15.00

General Electric Co., West Lynn, Mass.
VOLTAGE REGULATION AND POWER STABILITY IN UNCONVENTIONAL ELECTRICAL GENERATOR SYSTEMS.
Quarterly progress rept. no. 6, 30 Sep-31 Dec 61. 31 Dec 61, 219p. incl. illus. tables.
(Contract NOw 60-0824-c)
Unclassified report

DESCRIPTORS: (*Electric power production, *Power supplies, *Thermoelectricity, *Thermionic emission, *Fuel cells, Generators, *Voltage regulators, Switching circuits, Control systems, Inverted rectifiers, Transistors, Rectifiers, Stability, Design.) (Power supplies, Sources, Voltage, Impedance, Electronic circuits, Semiconductors, Tests.)

Research continued on the study of voltage regulation and power stability in Unconventional Electrical Generator systems. Test results are presented which illustrate the control of fuel cell output voltage by varying the velocity of mixtures of inert gas and reactant gas past the appropriate electrode. Information is included showing typical dynamic characteristics of thermoelectric and thermionic power sources. Design data giving weight, volume, and efficiency of series regulating switching circuits and dc-dc and dc-ac power transistor voltage converter circuits are presented. Weight versus efficiency characteristics of various combinations of source voltage control and external voltage converters are included. Weight data on minimum weight complete systems incorporating voltage regulation and conversion are presented. A laboratory model system consisting of a fuel cell and a dc-dc voltage converter-regulator is described. Performance test results for this laboratory model system are presented. (Author)

8. ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-273 475 Div. 8, 5
(TISTE/NTM) OTS price $2.60

Aerospace Corp., El Segundo, Calif.
CHARACTERISTICS OF BURIED ANTENNAS,
by P. L. Bargellini. 2 Nov 61, 20p. 14 refs.
(Rept. no. TDR-930(2505-50)TN-2)
(Contract AF 04(647)930)
Unclassified report

DESCRIPTORS: (*Dipole antennas, Communication equipment, Antenna radiation patterns, Low frequency, Very low frequency, Underground structures.) Antennas, Communication systems, Radio waves, Propagation, Attenuation, Electrical properties, Soils.

Horizontal electric dipoles buried in the ground are studied with special attention to their radiation efficiency at VLF and LF. The fundamental role of the currents excited in the ground and the need for low conductivity ground are emphasized. Discrepancies systematically observed between measured and computed values of the distant fields are attributed to certain insufficiencies of a previously available analysis. A modified treatment based on the equivalence of buried antennas (electric of magnetic dipoles) and of a magnetic dipole over a lossy ground is presented. According to this treatment, lower values of the radiation efficiency are to be expected theoretically. The results of the low field measurements appear, therefore, justified. (Author)

AD-273 509 Div. 8, 6
(TISTE/CDM) OTS price $2.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
PRECISION FREQUENCY CONTROL OF A HIGH-POWER MILLIMETER KLYSTRON,
by C. M. Steinmetz. 3 Jan 62, 26p. incl. illus. 8 refs. (Technical rept. no. 253)
(Contract AF 19(604)7400)
(AFESD TDR 62-65)
Unclassified report

DESCRIPTORS: (Frequency, Control of an Extremely high frequency, *Klystrons, *Microwave oscillators.) (*Radar transmitters, Microwave frequency, Design, Stabilization systems, Phase studies, Stabilization.)

The design and implementation of a stable 35-kMc 30-watt cw transmitter that uses a floating-drift-tube klystron oscillator is described. The system, both frequency and phase, locks the klystron oscillator to a low-power stable oscillator. An analysis of the phase-locked system is made and schematic diagrams are presented for the complete system. The performance of the entire stabilization system surpassed the design objectives. The spectral width is about 50 c, which is considerably better than the 250 c originally chosen for the design objective. It is felt that, with additional work, the spectral width could be narrowed further. However, the radar system does not require such a narrow bandwidth and hence this has not been attempted. (Author)

AD-273 510 Div. 8
(TISTE/CDM) OTS price $3.00

Lincoln Lab., Mass. Inst. of Tech., Lexington.
THE DESIGN OF SEMICONDUCTOR-DIODE DETECTOR CIRCUITS,
by G. R. Curry and M. Axelbank. 28 Feb 62, 166p. incl. illus. tables, 37 refs. (Rept. no. 47G-3)
(Contract AF 19(604)7400)
(AFESD TDR 62-66)
Unclassified report

DESCRIPTORS: (*Semiconductors, *Diodes, *Modulators, Detectors, Circuits, Design, Transistors, *Electronic circuits, High frequency, Very high frequency, Theory, Operation, Measurement, Mathematical analysis, *Bibliography.)

A theoretical and experimental investigation was made of the design of detector circuits using semiconductor diodes. The detector circuits are intended for use with transistor circuits having impedance levels of a few thousand ohms and current levels of a few milliamperes at frequencies up to 100 mc. A survey of the literature on detector-circuit design and semiconductor-diode theory is given. A detector-design procedure, based on semiconductor theory, is presented that permits the calculation of detector-circuit performance on the basis of measurements of the parameters of the diode to be used. The effects of frequency, diode parameters, detector load and driving circuits, temperature, and output coupling are considered. The application of the design theory to the practical design of detector circuits is given. Sample designs of both high-impedance and pulse detectors are carried out, and measurements on sample detectors are reported. Measurements for evaluating the performance of several diode types in high-impedance and pulse detector circuits are presented. (Author)

AD-273 572 Div. 8
(TISTE/NTM) OTS price $3.60

Norwegian Defence Research Establishment.
MEASUREMENT OF CHARACTERISTICS OF PARAMETRIC AMPLIFIER DIODES,
by G. W. Rosenberg, T. Schaug-Pettersen, and A. Tonning. 23 Nov 61, 24p. illus. 2 refs.
(Technical note no. 3)
(Contract AF 61(052)484)
(AFCRL 62-132) Unclassified report

DESCRIPTORS: (*Parametric amplifiers, *Diodes, Electrical properties, Electronic circuits, Impedance, Measurement.) (Microwave amplifiers, Semiconductors, Materials, Nonlinear systems, Theory, Mathematical analysis, Computers.)

Methods are discussed for static and dynamic measurement of parametric amplifier diodes. From the values of the diode P.T.O. impedance, measured over a wide range of frequencies, the element values of the circuit diagram may be determined by means of electronic computers. A figure of fd is defined, and a method for its determination from dynamic measurements of the diode is given. (Author)

AD-273 589 Div. 8, 25
(TISTE/CDM) OTS price $3.60

Westinghouse Electric Corp., Dayton, Ohio.
500 C SILICON CARBIDE RECTIFIER PROGRAM.
Interim technical progress rept. no. 1, 1 Sep-31 Dec 61,

by H. C. Chang, R. B. Campbell and others. Jan 62, 24p. incl. illus. 6 refs. (Contract AF 33(657)7027) (ASD TR 7-727, vol. 1) Unclassified report

DESCRIPTORS: (High temperature research, Silicon compounds, Carbides, *Crystal rectifiers, Electronic equipment, Guided missiles, Satellite vehicles, Supersonic planes.) (Rectifiers, *Crystals, *Production, *Manufacturing methods, Encapsulation, Sublimation, Pyrolysis.)

A production study was initiated on 500 C silicon carbide rectifiers. Hexagonal silicon carbide crystals were grown in a Kroll-type furnace by the sublimation technique. To increase the yield of usable crystals for device fabrication, a new Kroll-type furnace was designed. The feasibility of vapor phase thermal decomposition methods was also investigated for the controlled growth of silicon carbide platelets and sheets. The initial effort emphasized the conditions for the preparation of crystals with a high degree of perfection. Aluminun-diffusion experiments were performed on small crystals. Diffused junctions of milliampere current capacity were made. The feasibility of epitaxially grown junctions by thermal decomposition was demonstrated. The methods of rectifier fabrication are being evaluated and revised to meet the needs of quantity production. It was found that the commercial metal-ceramic header presently in use cannot meet the requirements of vacuum tight operation for 1000 hrs at 500 C. (Author)

AD-273 595 Div. 8, 25
(TISTP/WH) OTS price $1.60

Aerospace Corp., Los Angeles, Calif.
AN EXPERIMENTAL STUDY OF THE PARALLEL PUMPED FERROMAGNETIC AMPLIFIER,
by E. R. Peressini, T. S. Hartwick and M. T. Weiss. Feb 62, 15p. incl. illus. 10 refs. (Rept. no. TDR-930(2250-20)TN-2) (Contract AF 04(647)930) (DCAS TDR 62-35) Unclassified report

DESCRIPTORS: (*Parametric amplifiers, Ferromagnetic materials, *Ferromagnetism.) (Amplifiers, Theory.)

The performance characteristics of the parallel pumped magnetostatic amplifier are experimentally determined. The gain bandwidth product and noise figure are measured as a function of pump power and compared with the usual parametric amplifier theory. Deviations occur which originate from a broadening of the signal and idle magnetostatic modes. This linewidth broadening increases with pump power and is due to pump saturation effects. When the usual theory for the gain bandwidth and noise figure is corrected, close agreement is obtained with the experimental data. (Author)

AD-273 598 Div. 8
(TISTP/TL) OTS price $1.60

Air Force Cambridge Research Labs., Bedford, Mass.
A MONOPOLE ARRAY DRIVEN FROM A RECTANGULAR WAVEGUIDE,
by Edward E. Altshuler. Jan 62, 9p. incl. illus. 7 refs. (AFCRL 62-8) (Proj. 4600) Unclassified report

DESCRIPTORS: (*Waveguides, *Antennas, Antenna radiation patterns, Transmission lines, Excitation.)

The elements of a monopole array can be excited by probe-coupling them to a rectangular waveguide. It is shown theoretically and verified experimentally that there is a monopole height that maximizes the power extracted from the waveguide for a given probe depth. The analysis treated the probe in the waveguide as a receiving antenna connected to the outer monopole by a short length of coaxial line. The relative power radiated was determined from insertion loss measurements at 2840 Mcps. (Author)

AD-273 600 Div. 8, 7
(TISIP/EH) OTS price $5.00

Armed Services Technical Information Agency, Arlington, Va.
MINIATURIZATION. AN ASTIA REPORT BIBLIOGRAPHY, comp. by Elizabethe H. Hall. 1 Mar 62, 382p. 764 refs. Unclassified report

DESCRIPTORS: Printed circuits, *Miniature cameras, *Miniature electrical equipment, *Miniature electron tubes, *Miniature electronic equipment, *Miniature fuzes, *Subminiature electrical equipment, *Subminiature electron tubes, *Subminiature electronic equipment, Packaged circuits.

This bibliography was prepared by ASTIA in response to frequent inquiries concerning miniaturization of electronic equipment. Citations are included for documents cataloged by ASTIA from 1952 through 1 March 1962, and are restricted to unclassified, unlimited references. References are arranged alphabetically by subject areas as indicated in the Table of Contents. Within each subject area reports published by Department of Defense contractors are listed alphabetically by source, contract and title; military reports are arranged by source and title. The classified section of the bibliography appears separately as a secret document, identified as AD-328 600.

AD-273 611 Div. 8, 25
(TISTE/CDM) OTS price $6.60

Air Force Cambridge Research Labs., Bedford, Mass.
WIDE-ANGLE MICROWAVE LENS FOR LINE SOURCE APPLICATIONS,
by W. Rotman and R. F. Turner. Jan 62, 56p. incl. illus. tables, 8 refs. (Rept. no. AFCRL 62-18) (Proj. 4600) Unclassified report

DESCRIPTORS: (*Lens antennas, Electromagnetic lenses, Microwave equipment, Design for *Radar antennas, Radar scanning, Theory, Mathematical analysis.) (Parabolic antennas, Coupled antennas, Transmission lines., Coaxial cables, Microwave frequency.)

Design equations for a constrained wide-angle, two-dimensional microwave lens were derived for the special case in which the front lens face is straight and in which lens elements can connect arbitrary points on the 2 lens contours. A phase analysis indicates that this lens design has very small coma aberrations and is capable of generating beams a fraction of a degree in width. Criteria are developed for selection of optimum lens parameters for specific applications. An experimental model in which the lens elements consist of coaxial cables was constructed to

demonstrate techniques of fabrication. Radiation patterns indicated the expected characteristics. The application of these principles to design of symmetrical three-dimensional lenses is briefly indicated. Tables of lens contour parameters and path length aberrations are presented for the specific case of a scan angle alpha of 30 degrees. (Author)

AD-273 614 Div. 8, 25
(TISTM/EJH) OTS price $3.60

Birmingham U. (Gt. Brit.).
RESEARCH IN MICROWAVE SPECTROSCOPY.
Technical rept.,
by J. Sheridan, A. P. Cox and J. K. Tyler.
Jan 62, 28p. incl. illus. tables, 6 refs.
(Contract AF 61(052)241)
(AFOSR-2392)
Unclassified report

DESCRIPTORS: (*Microwave spectroscopy, Miniature electronic equipment, Frequency multipliers, Radiofrequency spectrum analyzers, Extremely high frequency, Diodes, Semiconductors.) (*Molecular spectroscopy, Hyperfine structure.) (Fluorides, Chlorides, Iodides, Cyanides, Acetylenes, Cyanamides, Azo radicals, Methanes, Nitramides, Thiols.) Spectrophotometers, Great Britain.

Refinements in methods of generation and detection of microwave harmonics at wavelengths down to the 1 - 2 mm region are discussed. Preferred methods are given for selection, shaping, mounting and adjustment of the point-contact diodes used. Other refinements of instrumentation have allowed the measurement of spectra of unstable and involatile molecules with the ability to resolve important hyperfine structures. New microwave spectroscopic measurements included evaluation of precise interatomic distances in fluorine cyanide and chloroacetylene, of electron-distribution properties of cyanamide and diazomethane from nuclear quadrupole effects, and the first precise structural information regarding nitramide in the gas phase. Refined values of centrifugal distortion constants were obtained for several molecules. (Author)

AD-273 615 Div. 8
(TISTE/NTM) OTS price $4.60

Boeing Co., Renton, Wash.
THE DOMINANT CUTOFF WAVELENGTH OF A T-SEPTATE LUNAR LINE,
by Ann Y. Hu and Dwight E. Isbell. Jan 62, 37p. incl. illus. tables. 7 refs. (Scientific rept. no. 3)
(Contract AF 19(604)6189, Proj. 4600)
(AFCRL 62-80) Unclassified report

DESCRIPTORS: (*Microwave equipment, *Transmission lines, Waveguides, Wave transmission, Electric fields, Magnetic fields, Bessel functions, Mathematical analysis, Design.)

A method is presented for calculating the lowest cut-off wavelength of a new microwave transmission line, the T-septate lunar line. The T-septate lunar line is a modified lunar line formed by 2 eccentric circular metal tubes; part of the inner metal tube is cut out and a metal bar is passed through the cut-out section to connect the opposing inner surfaces of the 2 tubes. The cross section of the T-septate lunar line is approximated by introducing a series of steps in the outer guide wall and dividing the cross section into m fan-shape regions. The method employed was found to be accurate to within approximately 10%. The accuracy of the calculation can be improved by including consideration of higher order modes in regions 1, 2 and 3 and/or by reducing the size of the regions considered, thus, increasing their number. The accuracy obtained in the given solution, however, is considered to be adequate from a practical standpoint. It is shown, both theoretically and experimentally, that the cut-off wavelength of a circular waveguide can be increased by a factor of more than 3.5 with the addition of a circular-T septum. (Author)

AD-273 628 Div. 8, 14, 25
(TISTM/GEC) OTS price $1.60

Hughes Aircraft Co., Malibu, Calif.
STUDY OF BOMBARDMENT-INDUCED-CONDUCTIVITY MATERIALS.
Interim scientific rept. no. 5, 15 Nov 61-14 Jan 62,
by N. H. Lehrer. 14 Jan 62, 12p. incl. illus.
(Contract AF 33(616)7563)
Unclassified report

DESCRIPTORS: (*Storage tubes, *Display systems, *Thin films, *Dielectric films, Zinc compounds, Sulfides, *Electron bombardment, Ion bombardment, Electrical conductance, Processing, Heat treatment, Crystals, Growth.) X-ray diffraction analysis.

Research was conducted to obtain the theoretical and experimental data concerning enhanced bombardment-induced-conductivity which would make possible the development of a direct-view storage tube with high resolution, selective erasure, and the simultaneous display of stored and nonstored information. Further experimental confirmation of a correlation between increasing crystal size and higher values of the conduction ratio was needed. It was established previously that thermal processing of the ZnS increases the crystal size and that 300 C thermally processed films exhibited about twice the value of the conduction ratio of non-thermally processed films. Measurements were made on films thermally processed at 450 and 600 C. X-ray diffraction patterns indicated that these films exhibited progressively larger size crystals than 300 C processed layers. Both the 450 and 600 C thermally processed layers exhibited conduction ratio values lower than those of the 300 C thermally processed layers, but higher than those of the non-thermally processed layers. This new evidence suggests that factors other than crystal size play a significant role in the bombardment-induced-conductivity effect. (Author)

AD-273 631 Div. 8, 6
(TISTW/DLW) OTS price $1.60

Naval Research Lab., Washington, D. C.
AN L-BAND DIGITAL PHASE SHIFTER,
by W. H. Harper and W. A. Douglas. 1 Mar 62, 13p. incl. illus. 9 refs. (NRL rept. 5740)
Unclassified report

DESCRIPTORS: (*Phase shifters, Triodes, Digital systems, *Switching circuits, Phase measurement, L band, Ultra high frequency, Electronic switches, Design.) (Radar antennas, *Transmission lines, Electronic circuits, Narrowband, Radar equipment, Design.)

A digitally controlled phase shifter was developed which has potential application to fixed-array radar systems. The device is capable of producing shifts in phase in steps of 2-13/16 degrees from 0 to 360 degrees. The phase shifter, which operates throughout at 1200 mc, utilizes G.E. type 6299 uhf-shf triodes, and different lengths of strip transmission lines, in seven stages to produce 128 steps of phase shift. A phase-shift accuracy of 3 degrees was maintained at the center frequency with a power gain of 14 to 17 db. A maximum phase error of ±20 degrees was observed over a 10-mc bandwidth centered at 1200 mc. Within certain rather narrow limits of frequency, triode grid and plate voltages, rf drive power, and tube characteristics, the circuit is capable of giving excellent control of phase shift. Once the phase shifter is tuned, there is no measurable change in phase with time. (Author)

AD-273 632 Div. 8, 26
(TISTM/EJH) OTS price $1.60

Aeronautical Electronic and Electrical Lab., Naval Air Development Center, Johnsville, Pa.
EVALUATION OF WELDED CONNECTIONS FOR AIRBORNE ELECTRONIC EQUIPMENT.
Phase rept.,
by S. R. Picard. 2 Feb 62, 9p. incl. illus. 4 refs. (Rept. no. NADC-EL-61121)
Unclassified report

DESCRIPTORS: (*Electronic equipment, Aircraft equipment, Electric connectors, Electric wire, *Welding, Welds, Feasibility studies, Reliability.) (Materials, Metals, Alloys, Nickel, Copper.)

Preliminary results of a NAVAIRDEVCEN investigation of welded connections and the results of investigations made by several manufacturers engaged in the production of welded assemblies and welding equipment are presented. At present an absolute nondestructive test for welded connections does not exist. Many materials are weldable, but all require determination and control of optimum energy and pressure to insure that a good metallic bond has been obtained. The most desirable lead diameters are in the range from 0.010 to 0.032 in. Minor cleaning of leads may be necessary but is not critical. The length of the component lead has no affect on the welded connection. There is some danger of component injury, but this can be practically eliminated. The over-all cost per unit of welded modules appears to be slightly higher than printed circuit boards. Other advantages of welded modules, which tend to offset their higher cost, include higher component density, expendable packaging, rapid construction, increased structural strength, and increased reliability. (Author)

AD-273 687 Div. 8
(TISTP/MFA) OTS price $4.60

Gordon McKay Lab. of Applied Science, Harvard U., Cambridge, Mass.
AN EXPERIMENTAL STUDY OF THE PROPERTIES OF ANTENNAS IMMERSED IN CONDUCTING MEDIA,
by Keigo Iizuka and Ronold W. P. King. 15 Dec 61, 17p. illus. (Scientific rept. no. 2)
(Contract AF 19(604)7262, Proj. 7661)
(AFCRL 62-223) Unclassified report

DESCRIPTORS: (Feasibility studies of *Physical properties of *Dipole antennas.) (Measurement of Admittance, Electrical conductance, Electrostatic capacitance, Electric currents.) (Storage tanks, *Liquids, Water.) (*Experimental data, Tables.)

Measured results of the driving-point admittance, the amplitude distribution of the current, and the phase distribution of the current relative to the phase at the driving point for a dipole antenna when immersed in homogeneous and inhomogeneous conducting media are presented. Measurements were also made of the amplitude distribution and phase distribution of the current for a half-wave dipole antenna immersed in a stratified medium for various gradients of the conductivity. The results of these experiments indicate that either an antenna of short electrical length or a half-wave dipole antenna can be used as a probe to measure the dielectric constant and conductivity of the medium in which it is immersed. A half-wave dipole antenna could well be used to detect an inhomogeneity in an extended medium. (Author)

AD-273 692 Div. 8, 7
(TISTM/EJH) OTS price $3.60

Ford Instrument Co., Long Island City, N. Y.
LOW TEMPERATURE THERMIONIC CONVERTERS.
Quarterly technical progress rept. no. 1, 1 Dec 61-1 Mar 62.
Mar 62, 17p. illus.
(Contract AF 33(657)7663)
Unclassified report

DESCRIPTORS: (*Electron guns, *Thermionic emission, Cesium, Design, Materials, Manufacturing methods, Anodes, Cooling, Temperature, Control, Tests.) (Molybdenum, Metals, Ceramic materials.) (Heat, Sun, Nuclear reactions, Simulation.) Spaceships, Low temperature research, *Power supplies.

Fabrication and development work performed on the investigation of low temperature thermionic converters are presented. The fabrication work included a high temperature metal-ceramic electron gun envelope, improvement in emitter brazing techniques and anode cooling techniques. Improved anode temperature uniformity was achieved with a gas cooling loop shaped in the form of a pancake helix. Mo or Cu powder improved the heat transfer between the helix and cup bottom. Cell processing and evaluation data is given as well as results of destructive and shock tests. Techniques for solar and nuclear simulation are discussed.

AD-273 721 Div. 8
(TISTE/NTM) OTS price $6.60

Ionosphere Research Lab., Pennsylvania State U., University Park.
A WIDE APERTURE, HIGH DIRECTIVITY, SCANNED ANTENNA ARRAY,
by Alfred B. Gschwendtner. 1 Apr 62, 61p. incl. illus. 23 refs. (Scientific rept. no. 158)
(NSF Grant G14246)
Unclassified report

DESCRIPTORS: (*Radio waves, Reflection, Diffraction, Propagation, Ionosphere, Phase measurement, Ionospheric propagation, Density, Analysis.) (*Coupled antennas, Linear systems, Phase detectors using Semiconductors, Switching circuits, Switches, Preamplifiers, Imstrumentation.) Digital recording systems, Digital computers.

The design is presented of instrumentation developed to record the complex amplitude distribution of pulsed radio waves after reflection by the ionosphere. The method of recording has as

its basis a semiconductor switch which provides rapid scanning of 6 antennas placed in a linear array. Although observations are currently being made visually with film recording, provisions were made for changeover to a digital recording method for analysis by a high speed computer. Complete descriptions of the various parts of the equipment are given, and preliminary results obtained by the visual method are shown. (Author)

AD-273 731 Div. 8, 6
(TISTE/CDM) OTS price $2.60

Electronic Defense Lab., Mountain View, Calif.
POLARIZATION SCANNER.
Progress rept.,
by Bernard J. Lamberty. 5 Feb 62, 20p. incl. illus. table, 7 refs. (Technical memo. no. EDL-M420)
(Contract DA 36-039-sc-87475)
Unclassified report

DESCRIPTORS: (Design, *Electronic scanners for Electromagnetic waves, Polarization, Tracking with S band, Conical antennas.) (X band, *Radar tracking by Ferrites, Rotating structures, Tests on Radar antennas, *Radar scanning.)

Progress in developing a polarization scanner for use with an existing S-band conical scanning antenna is described. An objective was to provide as simple a system as possible, both in terms of modification to an existing position tracking system and in terms of operational complexity. A block diagram of one such system, using a ferrite rotator, is presented, and preliminary experimental results are described. Some difficulties were encountered, chiefly due to operation at S-band. Use of a ferrite rotator appears to be more feasible for use at X-band. Another system involving peak-holding techniques was investigated. This system was used successfully to track a moving light source. The success achieved shows that the peak-holding technique could be used for polarization scanning of microwave signals. (Author)

AD-273 781 Div. 8
(TISTP/MFA) OTS price $1.60

Naval Research Lab., Washington, D. C.
SMALL-SIGNAL ANALYSIS OF MONOTRONS USING A CIRCULAR CYLINDRICAL TM 1mn RESONATOR,
by H. D. Arnett. 16 Mar 62, 16p. incl. illus. tables, 4 refs. (NRL rept. no. 5749)
Unclassified report

DESCRIPTORS: (Analysis of *Electron beams, *Camera tubes of *Radio signals, Cylindrical bodies, Design.) (*Radiofrequency power, Microwave equipment, Cavity resonators, Resonance, Electromagnetic waves, Oscillation.) (Motion of Electrons, Bessel functions, Taylor's series, Differential equations.)

A theoretical treatment of the small-signal aspects of the generation of microwave power by passing an electron beam axially through a circular cylindrical cavity is presented where the beam interacts with the axial component of the electric field of the transverse magnetic modes of the cavity. The most favorable conditions for oscillation occur when the transit time is such that an unmodulated electron requires approximately q + (1/4) cos n pi periods of the oscillation in traveling through the cavity. The small-signal electronic efficiencies are computed and plotted, and under the assumption that the power dissipated within the cavity can be attributed solely to skin-effect losses in the cavity walls, the unloaded starting currents are computed. It is shown that, from the standpoint of minimizing the starting current, the best mode to employ is the TM011 mode. Further, the starting current for the TM011 mode is minimized when the ratio of cavity length to cavity diameter is 1.544. (Author)

AD-273 790 Div. 8
(TISTE/NTM) OTS price $1.60

Army Signal Research and Development Lab., Fort Monmouth, N. J.
MEASUREMENTS OF WAVEFRONT DISTORTION AND THE ELECTRICAL PROPERTIES OF GROUND AT HIGH FREQUENCIES,
by Donn V. Campbell. Dec 61, 9p. incl. illus. table, 2 refs.
(ASRDL technical rept. no. 2239)
Unclassified report

DESCRIPTORS: (*Electromagnetic waves, *Electromagnetic fields, Polarization, Distortion.) (*Dipole antennas, Linear systems, Earth, Soils, Terrain, Electrical properties.) (Radiofrequency, High frequency, Measurement, Mathematical analysis.) Communication systems.

The polarization and direction of the electromagnetic field, produced by a distant source of radiation, are affected by electrical ground properties, terrain contours, and vegetation. These effects have been measured along the axis of a 1.2-mile linear antenna array (ISCAN), presently under separate investigation. The method of evaluating the measurements is described and the results correlated with known features of the site. (Author)

AD-273 803 Div. 8
(TISTE/CDM) OTS price $15.00

Cornell U. School of Electrical Engineering, Ithaca, N. Y.
THEORETICAL AND EXPERIMENTAL INVESTIGATION OF LINEAR BEAM MICROWAVE TUBES.
Final rept., pts. 1-2A, 1 Apr 57-31 Aug 61. 31 Aug 61, 1v. incl. illus. refs. (Research rept. no. 514)
(Contract AF 30(602)1696)
(RADC TDR 61-303, pts. 1-2A)
Unclassified report

DESCRIPTORS: (*Electron beams, *Linear systems, *Electron tubes, Microwave frequency, Theory.) (Electronic circuits, Electron beams, Interaction.) (Electron beams, Velocity, Modulation, Distribution, Measurement, Mathematical analysis, Cavity resonators, Electron guns.) (Electron beams, Electromagnetic fields, *Space charges, *Microwaves, Theory, Mathematical analysis, Klystrons, Nonlinear systems, Microwave amplifiers.)

This report includes:
THE VELOCITY DISTRIBUTION IN A VELOCITY-MODULATED ELECTRON BEAM FROM A SHIELDED PIERCE GUN. Technical rept. no. 15 on Linear Beam Microwave Tubes, by A. S. Gilmour, Jr. 25 Aug 61 (Research rept. no. EE 507)

NONLINEAR SPACE-CHARGE-WAVE ANALYSIS. Technical rept. no. 17 on Linear Beam Microwave Tubes, by P. R. McIsaac. 15 Sep 61 (Research rept. no. 513)

Factors important in determining the performance capabilities of high-power linear-beam microwave tubes were studied and means of improving their performance were sought. Basic studies were made of beam-circuit interaction, interaction circuits, electron beams, and cathode phenomena. The main purpose was to increase the understanding of such important phenomena as spurious signal generation, X-rays caused by RF induced highspeed electrons, cathode limitations, and related phenomena. (Author)

AD-273 804 Div. 8
(TISTE/NTM) OTS price $19.75

Cornell U. School of Electrical Engineering, Ithaca, N. Y.
THEORETICAL AND EXPERIMENTAL INVESTIGATION OF LINEAR BEAM MICROWAVE TUBES.
Final rept., pt. 2B, 1 Apr 57-31 Aug 61. 31 Aug 61, 1v. incl. illus. refs. (Research rept. no. EE 515)
(Contract AF 30(602)1696)
(RADC TDR 61-303, pt. 2B)
Unclassified report

DESCRIPTORS: (*Electron beams, *Linear systems, Electron tubes, Microwave frequency, Theory.) (Electronic circuits, Electron beams, Electrons, Interaction.) (*Klystrons, Cavity resonators, Electron beams, Harmonic analysis, Plasma physics, Magnetic fields, Modulation, Propagation, Space charges, Mathematical analysis.) Microwave amplifiers, Nonlinear systems.)

This report includes:
ON THE NONLINEAR THEORY OF THE PLANE KLYSTRON TUBE. Tech. rept. no. 13 on Linear Beam Microwave Tubes, by S. Olving. 15 June 61 (Research rept. no. EE 500)

NONLINEAR SPACE-CHARGE-WAVE THEORY OF THE RADIALLY FINITE ELECTRON BEAM. Tech. rept. no. 10 on Linear Beam Microwave Tubes, by S. Olving. (EE 497)

Research rept. EE 458, AD-237 613

ON THE DYNAMICS OF MAGNETICALLY FOCUSED ELECTRON BEAMS. Tech. rept. no. 14 on Linear Beam Microwave Tubes, by Peter S. Bottorff. (EE 505)

THE KINETIC A-C POWER FLOW IN NONHOMOGENEOUS RELATIVISTIC ELECTRON BEAMS. Tech. rept. no. 12 on Linear Beam Microwave Tubes, by S. Olving. (EE 499)

AN INTRODUCTORY RELATIVISTIC STUDY OF THE LLEWELLYN ELECTRONIC GAP. Tech. rept. no. 11 on Linear Beam Microwave Tubes, by S. Olving. (EE 498)

AD-273 805 Div. 8
(TISTE/CDM) OTS price $16.50

Cornell U. School of Electrical Engineering, Ithaca, N. Y.
THEORETICAL AND EXPERIMENTAL INVESTIGATION OF LINEAR BEAM MICROWAVE TUBES.
Final rept., pts. 2C-3, 1 Apr 57-31 Aug 61. 31 Aug 61, 1v. incl. illus. tables, refs. (Research rept. no. EE 516)
(Contract AF 30(602)1696)
(RADC TDR 61-303, pts. 2C-3)
Unclassified report

DESCRIPTORS: (*Electron beams, *Linear systems, *Electron tubes, Microwave frequency, Theory.) (*Electronic circuits, Electron beams, Interaction.) (Electron beams, Velocity, Density, *Modulation, Mathematical analysis, Digital computers, Ballistics.) (*Klystrons, Cavity resonators, Harmonic analysis, *Radiofrequency power, Measurements.)

This report includes:
BALLISTIC ANALYSIS OF AN ELECTRON BEAM IN A KLYSTRON. Technical rept. no. 16 on Linear Beam Microwave Tubes, by I. Turkekul. 30 Aug 61 (Research rept. no. EE 508)

Research rept. no. EE 483, AD-256 694.

Research rept. no. EE 418, AD-226 393.

NOTE ON THE PRELIMINARY RESULTS OF SPURIOUS OUTPUT POWER MEASUREMENTS, by A. Ray Howland, Jr.

Research rept. no. EE 429, AD-226 393.

The behavior of an electron beam in a buncher gap is investigated using a graphic analysis based on the results given by a Datatron 220 digital computer. The velocity and current distribution emerging from this gap are found. The graphic results are approached by successively approximating the transit time correction factor. The results obtained by successive approximation are then used as initial conditions in analyzing the behavior of the electron beam in the drift space. (Author)

AD-273 806 Div. 8
(TISTE/CDM) OTS price $18.50

Cornell U. School of Electrical Engineering, Ithaca, N. Y.
THEORETICAL AND EXPERIMENTAL INVESTIGATION OF LINEAR BEAM MICROWAVE TUBES.
Final rept., pts. 4-5, 1 Apr 57-31 Aug 61. 31 Aug 61, 1v. incl. illus. tables, refs. (Research rept. no. 517)
(Contract AF 30(602)1696)
(RADC TDR 61-303, pts. 4-5)
Unclassified report

DESCRIPTORS: (*Electron beams, *Linear systems, *Electron tubes, Microwave frequency, Theory.) (Electron beams, Test equipment.) *Oxide cathodes, *Cathodes (Electron tubes), *Diodes.

This report includes:
Research rept. no. EE 495, AD-272 211
Research rept. no. EE 482, AD-256 693
Research rept. no. EE 469, AD-256 691
Research rept. no. EE 430, AD-226 393

AD-273 814 Div. 8, 6, 19
(TISTW/DLM) OTS price $5.60

General Electric Co., Santa Barbara, Calif.
COMPARISON OF IR VIDICON AND SENSITIVE VISIBLE LIGHT CAMERA TUBE FOR APPLICATION IN AIRBORNE-TV GUIDANCE/RECONNAISSANCE SYSTEMS,
by G. L. Dunn. 6 Nov 61, 53p. incl. illus. tables (Rept. no. 61 SPC-7)
Unclassified report

DESCRIPTORS: (*Iconoscopes, Television cameras, *Camera tubes, *Infrared image tubes, *Infrared television systems, *Television guidance, *Aerial reconnaissance, Airborne, Effectiveness, Analysis.) (Camera tubes, Optical equipment, Infrared equipment, Sensitivity, Signal-to-noise ratio.) (Surface area, Surface temperatures, Illumination, Brightness, Intensity, Blackbody radiation, Mathematical analysis.)

The basic principles of radiation from a heated surface are examined. Equations are developed that provide a means of determining the performance of an infrared or visible light TV system in terms of the camera tube, quantum efficiency, the noise current and the lens diameter and F number. The over-all system performance is given in terms of RMS current signal-to-noise ratio, and frame repetition rate at a signal-to-noise ratio of 2. In the case of the visible light sensitive tube, the relationship between object illumination and signal-to-noise ratio, and resolution vs. lens diameter are tabulated and plotted. This study indicates that the IR Vidicon would have greater application for use in the TV Guidance/Reconnaissance Systems than the visible light sensitive camera. The advantages of the IR Vidicon over the visible light tube are discussed. (Author)

AD-273 819 Div. 8, 14, 26
(TISTM/EJH) OTS price $4.60

General Electric Co., Syracuse, N. Y.
CERAMIC POWER TRANSFORMERS.
Final development rept., 1 June 60-1 Jan 62.
Jan 62, 44p. incl. illus. table.
(Contract NObsr-81369)
Unclassified report

DESCRIPTORS: (*Power transformers, Transformers, *Power amplifiers, Low frequency, Very low frequency, Oscillator circuits, Materials, Ceramic materials, Ferroelectric materials, Piezoelectric materials, Manufacturing methods.) (Barium compounds, Titanates.) Electronic equipment.

The results of a ceramic transformer development program are summarized. This program included an analytical study of device operation, measurement techniques, tapped transformers, oscillator circuits, and the effects of glass glazes on the ceramic material. Design, construction, and measurement procedures are described. A detailed evaluation of 4 representative transformers fabricated during Phase III of this program is included. These devices operate in the frequency range from 18 to 77 kc at output powers from 2 to 22 w. Efficiencies between 66 and 81% are realized. The ceramic transformer may be tapped readily, and will provide its own capacitance internally for rectification in the voltage doubler circuit. It operates well over a wide range of temperatures, and cannot be damaged by short circuit loading. Perhaps the most unusual property is the absence of magnetic fields and ferromagnetic material. Thus the transformer will not distort existing magnetic fields in its vicinity. (Author)

AD-273 829 Div. 8, 26
(TISTN/RD) OTS price $7.60

Motorola, Inc., Phoenix, Ariz.
COMPATIBLE TECHNIQUES FOR INTEGRATED CIRCUITRY.
Quarterly rept. no. 3, 1 Nov 61-31 Jan 62.
1 Apr 62, 45p. illus.
(Contract AF 33(616)8276)
Unclassified report

DESCRIPTORS: (*Semiconductors, Gallium compounds, Arsenides, Silicon, Crystals, Growth, Silicon compounds, Dioxides, Thin films.) (*Electronic circuits, Tantalum capacitors, Resistors of Nickel alloys and Chromium alloys and Capacitors of Silicon and Dioxides.) Manufacturing methods.

Most of the effort to date has been spent in developing process techniques which are necessary for integrated circuit fabrication. This effort has been both in morphological areas and thin films as applied to semiconducting substrate. Further efforts in perfecting our epitaxial techniques are reported. A program has been started to develop and fabricate typical circuits which are practical for a wide range of high and low frequency amplifier applications as well as logic circuits. (Author)

AD-273 835 Div. 8, 26
(TISTE/CAM) OTS price $1.60

Motorola, Inc., Phoenix, Ariz.
MINIATURE THIN-FILM INDUCTORS.
Interim development rept. no. 3, 1 Dec 61-1 Mar 62,
by F. R. Gleason. 20 Mar 62, 15p. incl. illus. tables, 1 ref. (Rept. no. WP-2631-7)
(Contract NObsr-85397)
Unclassified report

DESCRIPTORS: (*Radiofrequency coils, *Miniature electronic equipment, Ferromagnetic materials, Ferrites, Thin films, Metal films, Nickel alloys, Iron alloys, Chlorides, Oxides, Zinc alloys, Cobalt alloys, Electroplating, Processing, *Manufacturing methods, Production, Design.) (Coils, Inductance, Measurement.)

Work is presented on the fabrication of thin-film inductors on bulk ferrite substrates and on the deposition of thin ferrite films with a practical permeability and Q value as measured at 1 mc. The problems encountered with fabricating coils of increased inductance on commercial ferrite are reviewed and methods for overcoming these are discussed. A number of techniques for the deposition of thin films of ferrite material are presented with emphasis on a method for the pyrolitic hydrolysis of metal inorganic salts to form films of the suitable oxides on selected substrates. Means for compositional, structural and magnetic analysis of the ferrite films are also included. (Author)

AD-273 847 Div. 8, 25
(TISTM/EJH) OTS price $4.60

Syracuse U. Research Inst., N. Y.
SMALL RESONANT SCATTERERS AND THEIR USE FOR FIELD MEASUREMENTS,
by Roger F. Harrington. 31 Jan 62, 47p. incl. illus. tables, 11 refs. (Task rept. no. 13; Rept. no. EE 492-6201T13)
(Contract AF 30(602)1640, Proj. 4506)
(RADC TDR 62-46) Unclassified report

DESCRIPTORS: (*Microwaves, *Electric fields, *Magnetic fields, Measurement, Scattering, Wire, Resonance, Mathematical analysis, Theory.) *Dipole antennas.

A general formulation for the back-scattered field from loaded objects is given. It is shown that small resonant objects produce a much greater back-scattered field than small nonresonant ones. The theory is applied to short dipoles and small loops. The use of small resonant scatterers to measure electric and magnetic fields by scattering techniques is discussed. Resonant scatterers are found to have several advantages over nonresonant scatterers when used for field measurements. (Author)

Division 8 - ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-273 848 Div. 8, 26
(TISTE/CDM) OTS price $8.60

Sylvania Electric Products, Inc., Woburn, Mass.
MICROMINIATURIZED PACKAGING OF 2N384 AND 2N6977
Final rept., 1 Oct 60-1 Feb 62,
by L. Epstein, C. Lawrenson and I. Feinberg.
1 Feb 62, 90p. incl. illus. tables.
(Contract DA 36-039-sc-85377)
Unclassified report

DESCRIPTORS: (*Transistors, Germanium, Silicon, Semiconductors, *Packaging, *Subminiature electronic equipment, Production, *Manufacturing methods, Design, Tests.)

Efforts were made to mount existing germanium drift field and silicon mesa transistor junction structures in an existing welded hermetically sealed miniature pancake package by making necessary part modifications and developing required assembly procedures. Design changes were made in the drift field transistor junction - base tab assembly and in the transistor header. A welded connection between base tab and base header lead was required to meet objective shock test requirements. Samples meeting the objective specifications were evaluated and delivered. The silicon mesa transistor junction structure required no modification. A molybdenum pedestal was added to the header for this device and associated material, brazing, and plating problems were solved. Samples meeting the objective specification were evaluated and delivered. The final packaged devices demonstrated excellent hermetic sealing. (Author)

AD-273 849 Div. 8
(TISTE/CDM) OTS price $13.00

Stanford Electronics Labs., Stanford U., Calif.
OPERATOR METHODS FOR PIECEWISE-LINEAR NETWORK ANALYSIS,
by C. H. Roth. 31 Oct 61, 180p. incl. illus. tables, 8 refs. (Technical rept. no. 2056-1)
(Contract Nonr-22524, Proj. NR 373-360)
Unclassified report

DESCRIPTORS: (*Electrical networks, Linear systems, *Nonlinear systems, Analysis by *Operators (Mathematics), Digital computers.) (*Electronic circuits, Diodes, Transistors, Electron tubes, Mathematical analysis, Theory, Programming.)

Efforts were made to develop systematic methods for the analysis of networks that contain piecewise-linear (PWL) elements. A general method was developed for analysis of resistive PWL networks, and special cases of PWL networks containing reactive elements were solved. As a more systematic method suitable for use with a digital computer, the PWL-operator method was developed. PWL operators are defined to represent the characteristic curves of PWL elements. The basic algebraic operations are defined for PWL operators and the algebraic properties are studied. A new operation is introduced, which solves a class of PWL-operator equations that cannot be solved in terms of the basic algebraic operations. PWL-operator methods are applied to determine input and transfer characteristics of resistive PWL networks, and the analysis of PWL two-ports is considered. PWL-operator methods are used to analyze vacuum-tube and transistor circuits. Extension of PWL-operator methods to PWL networks that contain reactive elements is considered. Computer programs for the analysis of PWL networks are discussed. (Author)

AD-273 850 Div. 8, 26, 30
(TISTE/CAM) OTS price $10.10

Texas Instruments Inc., Dallas, Tex.
SILICON SEMICONDUCTOR NETWORKS MANUFACTURING METHODS.
Interim technical engineering rept. 1 July-30 Sep 61,
by J. W. Lathrop, W. C. Brower and H. G. Cragon.
Mar 62, 120p. incl. illus. tables.
(Contract AF 33(600)42210, Proj. 7-865)
(ASD IR 7-865, Vol. 4)
Unclassified report

DESCRIPTORS: (*Semiconductors, Silicon alloys, Electronic circuits, Materials, Processing, Manufacturing methods, Chemical milling, Diffusion, Packaging.) (*Digital computers, *Subminiature electronic equipment, *Miniature electronic equipment, Electronic circuits, Switching circuits, Transistors, Diodes, Resistors, Capacitors, Design, Testing.)

Process techniques, manufacturing equipment designs, and assembly techniques for solid circuit semiconductor networks were established. Pilotr-line equipment was constructed, evaluated, and improved. Effort was concentrated on developing and refining processes for producing single-chip, planar, oxide-protected devices with evaporated lead interconnections. Emphasis remained on doing as much processing as possible on silicon in slice form. This philosophy necessitated further refinements to ensure isolation of components. Several methods of improving isolation are described. A molecular electronic computer incorporating 587 semiconductor networks was completed and tested. (Author)

AD-273 858 Div. 8, 25, 15
(TISTP/WH) OTS price $7.60

Electronics Research Lab., U. of Calif., Berkeley.
STABILITY STUDY OF PULSE-WIDTH MODULATED AND NON-LINEAR SAMPLED-DATA SYSTEMS,
by T. Nishimura. 4 Apr 61, 68p. incl. illus. 23 refs. (Series no. 60, Issue no. 353)
(Contract AF 18(600)1521)
(AFOSR-2268) Unclassified report

DESCRIPTORS: (Stability of *Feedback *Control systems.) (Feedback Signals, Pulse modulation, Nonlinear systems.) (Oscillators, Wave analysis.) (Data, Sampling, Feedback.)

The fundamental equation that describes limit cycles in nonlinear sampled-data systems was derived. The equivalence of limit cycles with finite pulsed systems having a periodically varying sampling-rate was observed, and the methods of analysis applied to the latter were extended to obtain these limit cycles with the aid of final value theorem. This fundamental equation is modified and simplified under certain assumptions as it can be applied to systems both with and without integrators. The limitation on the longest period of saturated and unsaturated oscillation is investigated and the critical gain for their existence is derived, starting from the modified fundamental equation. Also, the stability of limit cycles and the equilibrium point is considered, based on Neace's method. Various kinds of non-linearities, namely, pulse-width modulation, relay saturating amplifier with linear zone and quantized level amplifier are discussed. Self-excited oscillations are mainly examined, as well as the possible existence and stability of limit cycles, however, the method can be extended to forced oscillations. (Author)

AD-273 875 Div. 8
(TISTE/NTM) OTS price $5.60

Electron Tube Research Lab., U. of Minn., Minneapolis.
STUDIES OF PRIMARY ELECTRON SOURCES.
Scientific rept. no. 1, 1 Mar-1 June 61,
by D. E. Anderson. Jan 62, 33p. illus.
(Contract AF 19(604)8381, Proj. 4619)
(AFCRL 62-72) Unclassified report

DESCRIPTORS: (*Cathodes (Electron tubes), *Oxide cathodes, Semiconductors, Coatings, Barium compounds, Oxides, Thin films.) (Thermionic emission, Ultraviolet radiation, Tests.) (Electrons, Nonlinear systems, Tantalum compounds, Oxides, Aluminum, Aluminum compounds, Measurement.)

An experimental system for studying the controlled activation and deactivation of alkaline-earth metal oxide cathodes is described. The activation rate can be controlled by the addition or removal of carbon as a reducing agent, while the cathode is independently exposed to a deactivating gas. Results of studies of long-pulse and dc emission changes from oxide-cathodes are presented, and the measurement system is described. Photoelectric measurements on a BaO coated cathode in conjunction with thermionic pulse emission measurements are described. The data obtained indicate a relationship between the thermionic and photoelectric emission. Experiments investigating the enhancement of thermionic emission by ultraviolet light are reported. The procedure used to produce BaO thin films on the standard cathode base structure is outlined and photoelectric yield curves are presented. A study of electron tunneling through thin insulating films was initiated. Methods for preparing experimental samples suitable for the measurements were developed. (Author)

AD-273 879 Div. 8, 26
(TISTE/CAM) OTS price $8.10

Western Electric Co., Laureldale, Pa.
PRODUCTION ENGINEERING MEASURE. DIFFUSED SEMICONDUCTOR DEVICES 7,12 PLUS 2N559 AND 2N1094.
Quarterly progress rept. no. 17, 10 Sep-10 Dec 61,
by M. N. Reppert. 10 Dec 61, 77p. incl. illus.
(Contract DA 36-039-sc-72729)
Unclassified report

DESCRIPTORS: (*Semiconductors, *Transistors, Production, Manufacturing methods, Industrial production, Design.) (Test equipment, *Machines, *Industrial equipment, Packaging, Computers.)

Development and pilot production objectives for devices 7 and 12 were met. Mechanization of 4 device 12 operations was accomplished and the mechanized pilot production was accepted. Mechanization of devices - 2N559 and 2N1094 is presented in the following areas: cleaning header lead wire, piece part cleaning, piece part gold plating, platform lead welding, header assembling, header glassing, header lead trimming, strip perforating and welding, header continuous rack plating, can punching and coding, can getter assembling, slice scribing, wafer breaking, screening and loading, wafer bonding, wire bonding, final cleaning, closure welding, coating, card loading, testing and date stamping - 2N559, testing and date stamping - 2N1094 and 2N1195, data handling, and card trimming and packaging.

AD-273 882 Div. 8, 25
(TISTE/CDM) OTS price $1.60

Foreign Tech. Div. Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
A NEW METHOD OF SHF AMPLIFICATION BY FERRITES,
by V. A. Fabrikov. 20 Feb 62, 19p. incl. illus. 10 refs. (Trans. no. FTD-TT-62-76 of Radiotekhnika i Elektronika 6:No. 10, pp. 1707-1717, 1961)
Unclassified report

DESCRIPTORS: (*Power amplifiers, Superhigh frequency, *Ferrites, Magnetic fields, Polarization, Mathematical analysis, Nonlinear differential equations, Linear differential equations.) (USSR, Radar signals, Radio signals, Amplifiers.)

A study was made of SHF amplification by ferrites in the presence of a magnetic-loss medium. The analysis was made on the basis of the solution of equations of motion of the gyromagnetic moments of a magnetized ferrite material under the action of 2 transversely polarized SHF signals of close frequency and of a longitudinal fluctuating reaction field. The solution of the problem was sought in a coordinate system which rotates synchronously with a constant (in magnitude) magnetic moment of the sample. The actual creation by the method under examination of a ferrite SHF power amplifier operating at powers less than 100 mw is represented, where the amplification factor is above 10 in the frequency band for which the difference frequency of the signal and local oscillator is with a few mc's. (Author)

9. FLUID MECHANICS

AD-273 478 Div. 9, 25, 8, 30
(TISTP/MFA) OTS price $3.60

Aerospace Corp., El Segundo, Calif.
MEASUREMENT OF ELECTRICAL CONDUCTIVITY OF IONIZED AIR DURING REENTRY,
by R. Betchov, A. E. Fuhs and others. 16 Jan 62, 26p. incl. illus. (Rept. no. TDR-930(2230-03)TR-1)
(Contract AF 04(647)930)
(DCAS TDR 62-3)
Unclassified report

DESCRIPTORS: (Measurement, *Electrical conductance of Air, Ionization during *Re-entry aerodynamics.) (*Instrumentation, Design of Shock waves, *Conductivity, *Meters for Satellite vehicles.) (Calibration and Flight testing under *Space environmental conditions.) (Magnetohydrodynamics, Experimental data, Reliability.)

An instrument has been developed for measuring the electrical conductivity of ionized air during reentry. The operation and design of the meter are discussed. Data from a 5000-mile flight of the meter aboard a reentry vehicle are presented and interpreted. Meter output is found to be correlated with vehicle dynamics during reentry. The estimated peak value of observed conductivity is 160 mhos/meter. (Author)

AD-273 562 Div. 9
(TISTP/MFA) OTS price $3.60

Texas A. and M. Coll., College Station.
BOUNDARY FLOW ALONG A CIRCULAR CYLINDER,

Division 9 - FLUID MECHANICS

by Robert O. Reid and Basil W. Wilson. Feb 62, 30p. incl. illus. tables, 10 refs. (Technical rept. no. 204-4)
(In cooperation with National Engineering Science Co.)
(Contract Nonr-211902)
Unclassified report

DESCRIPTORS: (Theory, Boundary layer, *Fluid flow, *Shear stresses along Cylindrical bodies.) (*Drag, Turbulence, Laminar boundary layer, Fluid mechanics, Viscosity.) (Towing cables, *Hydrodynamics, Tests.)

The Karman-Prandtl mixing-length theory for fluid flow over a flat surface with a laminar sublayer near the boundary is adapted to the flow along an infinite circular cylinder on the supposition that flux of momentum inwards towards the boundary is controlled by a continuity condition arising from the radial nature of the convection. Experimental results for smooth and rough pipe flows are invoked to develop the nature of the boundary flow over a range of conditions from the quasi-smooth to the fully turbulent regimes. The drag coefficient for tangential friction is evaluated as a function of Reynolds number and surface roughness. Theoretical indications compare favorably with results from towing tests of stranded cables. (Author)

AD-273 568 Div. 9, 1
(TISTA/WAW) OTS price $1.00

National Aeronautics and Space Administration, Washington, D. C.
A THEORETICAL INVESTIGATION OF THE EFFECT OF CROSS-CONTROL DERIVATIVES ON THE STABILITY CHARACTERISTICS OF AIRPLANES DESIGNED FOR FLIGHT AT HIGH MACH NUMBERS,
by Lawrence W. Brown. Mar 62, 31p. incl. illus. tables, 6 refs. (Technical note D-1223)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical Note D-1223.

DESCRIPTORS: (*Hypervelocity vehicles, Jet planes, Hypersonics, *Stability (Lateral), Stability, Oscillation, Roll, Yaw, Damping, Stabilization systems, Mathematical analysis, Differential equations, Theory.)

Linearized equations of motion were used to determine the lateral stability characteristics of a high-speed airplane with aerodynamic controls at Mach 6 and at an altitude of 125,000 feet. The period and damping of the oscillatory mode, the damping of the aperiodic modes, and the ratio of the roll angle to the sideslip angle were analyzed to determine the effects of the cross-control derivatives. Results show that an increase in the roll-damper gain causes a relatively large increase in the damping with a moderate increase in the frequency of the Dutch roll mode as a result of the cross-control effectiveness. This could cause critical ratios of the roll angle to the sideslip angle if a negative effective dihedral exists. In addition, when damper gains are relatively large, the cross-control derivatives could overcome divergence that results from a negative effective dihedral and a small directional derivative. (Author)

AD-273 674 Div. 9, 10, 25, 30
(TISTA/WAW) OTS price $4.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
SIMULATION OF HIGH TEMPERATURE AIR FOR AERODYNAMIC AND HEAT TRANSFER TEST PURPOSES,
by K. E. Tempelmeyer, M. N. Nesbitt, and J. E. Shepard. Mar 62, 42p. incl. illus. tables, 16 refs. (Rept. no. AEDC TDR 62-40)
(Contract AF 40(600)800, Proj. 8951)
Unclassified report

DESCRIPTORS: (Wind tunnels, *Supersonic wind tunnels, High temperature research, Simulation of *Gas flow of Air by Exhaust gases, Thermodynamics, Mathematical analysis, Tests.) (Aerodynamics, Heat transfer, Aerodynamic heating, Test methods, Test facilities.) (*Hydrocarbons after Combustion with Argon, Helium, Oxygen, Physical properties.) (Pipes, Gas flow, Drag, Heat transfer, Mathematical analysis, Tests.)

A method to simulate a gaseous test medium for aerodynamic and heat transfer tests is proposed. The solution of a set of simultaneous equations is employed to specify a gas mixture which has the same macroscopic thermal and transport properties as some other gas or mixture. Experimental tests to determine the effectiveness of this gas simulation theory are also described. The addition of small amounts of argon, helium, and oxygen to a hydrocarbon combustion gas resulted in a new gas mixture which produced the same heat transfer and friction coefficients as air heated to the same temperature. A combustion gas test medium alone, however, exhibited different heat transfer characteristics than air. Thus, it appears possible to avoid the use of some impractical test medium for certain test purposes by replacing it with a more convenient mixture of gases. (Author)

AD-273 747 Div. 9, 1
(TISTA/WAW) OTS price $2.60

Therm, Inc., Ithaca, N. Y.
A FEASIBILITY STUDY ON THE MEASUREMENT OF THE TIME-DEPENDENT SHROUD PRESSURE OF A DUCTED PROPELLER,
by Gary R. Hough. Aug 61, 24p. incl. illus. tables, 18 refs. (Rept. no. TAR-TR 612)
(Contract Nonr-285900)
Unclassified report

DESCRIPTORS: (*Shrouded propellers, *Aerial propellers, Aerodynamics, Pressure, Transients, Turbulence, Instrumentation.) (*Pressure gages, *Piezoelectric transducers, Harmonic analysis, Design, Tests.) (Propeller noise, Vibration, Turbulent boundary layer, Instrumentation.)

Results of a limited study on the measurement of the instantaneous incremental shroud pressure on a ducted propeller by means of a piezoelectric transducer are given. The instrumentation is described and photographs of the observed pressure pattern presented. The feasibility of such measurements, the reproducibility and quality of the signal, and the magnitude and decay of the higher harmonics over a range of advance ratios are examined. (Author)

AD-273 754 Div. 9, 1
(TISTA/WAW) OTS price $.75

National Aeronautics and Space Administration, Washington, D. C.
FLIGHT-DETERMINED AERODYNAMIC-NOISE ENVIRONMENT OF AN AIRPLANE NOSE CONE UP TO A MACH NUMBER OF 2,
by Norman J. McLeod. Mar 62, 28p. incl. illus. table, 7 refs. (NASA Technical note D-1160)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1160.

DESCRIPTORS: (Conical bodies, *Airplane noses for Jet fighters, Glass textiles, Aerodynamics, Transonics, Supersonics, *Jet plane noise, Measurement, Model tests, Wind tunnel models.)

The aerodynamic-noise environment of a Fiberglas nose cone for a fighter-type airplane was measured over a Mach number range from 0.8 to 2. The measurements were obtained at altitudes of about 26,000 feet and 40,000 feet for a dynamic-pressure range of approximately 200 lb/sq ft to 1,000 lb/sq ft. The data showed that the aerodynamic-noise level on the surface of the cone increased with free-stream dynamic pressure. The average noise pressure varied from approximately 0.001 of the lower dynamic pressures to approximately 0.0005 of the higher dynamic pressures. The noise level in the octave bands below 2,400 cycles per second showed large deviations from the mean, which would cause serious error in structural-fatigue tests when such tests are based on the average level. Variations in angle of attack of from 1 to 5 had negligible effect on the noise levels; however, at an altitude of 40,000 feet and an angle of attack of approximately 0 degrees, intermittent increases in noise levels were measured. (Author)

AD-273 817 Div. 9, 30
(TISTA/LSK) OTS price $3.60

General Dynamics/Astronautics, San Diego, Calif.
METHODS OF ANALYSIS OF MICROWAVE SCATTERING FROM WAKES OF HYPERVELOCITY PROJECTILES,
by W. R. Bradford and B. H. Siperly. 12 Feb 62, 31p. incl. illus. 5 refs. (Rept. no. AE 62-0218M)
(Contracts DA 04-495-ORD-3112 and DA 04-495-ORD-3383, Proj. DEFENDER)
Unclassified report

DESCRIPTORS: (Microwaves, Scattering, *Wakes, *Hypervelocity projectiles.) (Boundary layer, Turbulence.) (Turbulent flow, Laminar boundary layer.)

Interpretation of ballistic range experimental results is outlined for tests conducted with 20mm blunt polyethylene projectiles. A detailed theoretical treatment of forward-scattered microwave signals from a dilute plasma column is given. Estimates of ionized wake diameters are made from schlieren photographs of the flow field and are related to back-scattered microwave signals. Returns from perfect scattering rods are compared to returns from an ionized wake in the overdense case. Decay rate changes are noted on microwave returns from an ionized wake and may indicate the transition from laminar to turbulent flow. An indication of roughness and separation of scattering centers is shown. (Author)

AD-273 837 Div. 9
(TISTA/LSK) OTS price $3.60

Polytechnic Inst. of Brooklyn, N. Y.
HEAT TRANSFER AND TEMPERATURE DISTRIBUTION IN A HEMISPHERICAL NOSE CONE IN HYPERSONIC FLOW,
by S. V. Nardo and Ronald W. Sadler. Jan 62, 20p. incl. illus. table, 9 refs. (PIBAL rept. no. 597)
(Contract Nonr-83923, Proj. NR 064-433)
Unclassified report

DESCRIPTORS: (Heat transfer, Temperature, Aerodynamic heating, Re-entry vehicles, Blunt bodies, *Hemispherical shells, *Guided missile noses, Wind tunnel models in Hypersonics.) (Theory, Mathematical prediction, Model tests.)

On the basis of the comparison between theory and experiment of heat transfer and temperature distribution, it is concluded that the simplified method used to predict temperatures within a hemispherical nose cone in a hypersonic flow is satisfactory. The restriction must be made to flows in the Reynolds Number range of from 1 to 5 times 10 to the 6th power, and to stagnation temperatures less than 4000 R. To apply the method it is first necessary to calculate the theoretical heat transfer for the appropriate Reynolds Number. Using the local values of the heat transfer, in conjunction with the transient, one-dimensional heat conduction solution through a spherical shell element, yields the temperature-time history at any point within the body. (Author)

AD-273 852 Div. 9, 31
(TISTA/WAW) OTS price $10.10

Technical Research Group, Syosset, N. Y.
THE UNSTEADY FORCES DUE TO PROPELLER-APPENDAGE INTERACTION,
Final rept.,
by O. Pinkus, J. R. Lurye, and D. Feit. Mar 62, 122p. incl. illus. (Rept. no. TRG-146-FR)
(Contract Nonr-328100)
Unclassified report

DESCRIPTORS: (*Marine propellers, Propeller blades, Sheets, Ship hulls, Interference, Hydrodynamics, Vortices, Wake, Thrust, Drag, Lift, Mathematical analysis, Differential equations, Integral equations.) Theory.

A study is presented of the nature of the unsteady forces in the field of a propeller rotating in the vicinity of an appendage. The propeller is assumed to be one of a high aspect ratio while the appendage although of finite width is assumed to be infinitely long and thus the problem is reduced to a study of the two-dimensional flow field around two flat plates. An essential feature of the analysis is that the mutual interference effects of propeller blade and appendage are taken into account. Two approaches are formulated. The rigorous method leads to a set of two simultaneous integral equations which are reduced to a single integral equation involving elliptic integrals. The simplified method employs the technique of substitution vortices which yields explicit analytic expressions for the quasi-state, apparent-mass and wake forces for both the propeller and appendage. Graphs and tables give the magnitude and variation of the propeller and appendage forces as functions of tip-clearance, distance and relative size of appendage and propeller. (Author)

AD-273 865 Div. 9, 12, 25
(TISTA/WAW) OTS price $5.60

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
STUDY OF INFRARED EMISSION FROM HYPERSONIC AIR FLOWS.
Semi-annual rept. 25 Sep-31 Dec 61,
by Walter H. Wurster, and Paul V. Marrone.
Jan 62, 46p. incl. illus. tables, 11 refs.
(Rept. no. QM-1626-A-2)
(Contract DA 30-069-ORD-3443)
Unclassified report

DESCRIPTORS: (*Re-entry vehicles, *Blunt bodies, Aerodynamic heating, *Re-entry aerodynamics, Aerodynamics, Hypersonics, Gas ionization, Shock waves, Thermal radiation, *Infrared radiation, Mathematical analysis, Measurement.) (Nitrogen, Air, Heating, Infrared radiation.)

Research is being conducted to formulate a comprehensive picture of the IR radiation from reentry bodies. The program is divided into: (1) the experimental determination of the radiative properties of the optically active gaseous species, and (2) the analysis of the blunt-body flow field, in which the finite-rate chemistry of the air is coupled with the aerodynamics of the flow. The final analysis of the nitrogen first-positive band spectrum has been completed. The measured intensities are lower by a factor of 5 than those reported for measurements in shock-heated air. The nonequilibrium radiation from this N2(1+) system, arising from the finite rate of electronic excitation has been studied. A machine program generated the spectra of radiating species from the known spectroscopic constants and the experimentally determined transition probabilities. Several re-entry flow calculations were completed, and a nonequilibrium scaling criterion investigated. Computations are discussed and the scaling criterion is valid for the IRBM (15,000 fps) and ICBM (23,000 fps) conditions. (Author)

AD-273 877 Div. 9
(TISTA/WAW) OTS price $8.10

Jet Propulsion Center, Purdue U., Lafayette, Ind.
DIFFUSER STUDIES WITH SINGLE- AND TWO-PHASE FLOWS,
by G. R. Schneiter. Apr 62, 72p. incl. illus. tables, 11 refs. (Rept. no. TM-62-1)
(Contract Nonr-110007)
Unclassified report

DESCRIPTORS: (Liquid jets, Jets into Duct inlets to *Diffusers for *Jet pumps, Hydrodynamics, Pressure, Tests, Mathematical analysis.) (Jets, Air in Water.)

An experimental investigation was conducted of two problems of diffuser flow which are encountered in a gas-driven jet pump. The first was concerned with determining the feasibility of diffusing a free jet of liquid. The second was concerned with determining the effect of entrained gas in the flowing liquid upon the diffusion process. In all of the experiments, conical diffusers were employed with water and air as the working fluids. It was found that up to 86.5% of the kinetic energy of the free jet could be recovered by employing the proper type and size of diffuser inlet, with the appropriate back pressure. Flow rate and the distance from the nozzle exit to the diffuser inlet had little effect on the energy recovery. The experiments indicated that when a gas is entrained in a liquid being diffused, the pressure recovery of the diffuser is reduced, the amount of reduction depending on the volume of entrained air and the static pressure at the throat of the diffuser. A theoretical analysis indicates that the reduction in pressure recovery due to gas entrainment should become smaller as the entrance velocity to the diffuser is increased. The experiments indicated, however, the possibility that compressibility effects may seriously reduce the pressure recovery for high velocity, two-phase flow in a diffuser. (Author)

10. FUELS AND COMBUSTION

AD-273 484 Div. 10, 16
(TISTB/CCH) OTS price $.50

Army Chemical Research and Development Labs., Army Chemical Center, Md.
SHORT-TERM INHALATION EXPOSURES OF RODENTS TO PENTABORANE-9.
Rept. for Dec 60-Sep 61 on Health Hazards of Materials and Radiation,
by Francis W. Weir, Dale W. Bath, and Maurice H. Weeks. Dec 61, 6p. incl. tables, 9 refs.
(Proj. 7165)
(ASD TR 61-663) Unclassified report

DESCRIPTORS: (*Pentaboranes, *Toxicity, Respiration, Dosage, Laboratory animals, Survival.)

Rats and mice were exposed to pentaborane to determine the concentration causing 50 per cent deaths for single 5-, 15-, 30-, and 60-minute exposure periods. The LC50 values for single 5-, 15-, 30-, and 60-minute exposure periods were: for rats, 66.6, 31.2, 15.2, and 10.4 ppm, respectively; for mice: 40.5, 18.6, 10.6, and 7.8 ppm, respectively. Information from these exposures is to be used in planning further studies which will aid in the estimation of safe levels for short human exposures to this compound. (Author)

AD-273 489 Div. 10, 4
(TISTM/TCG) OTS price $3.60

Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF THE MECHANISM OF THE TITANIUM-LIQUID OXYGEN EXPLOSIVE REACTION.
Rept. for 1 Oct 60-1 Sep 61 on Metallic Materials,
by J. D. Jackson, P. D. Miller and others.
Jan 62, 29p. incl. illus. tables, 6 refs.
(Contract AF 33(616)7595, Proj. 7351)
(ASD TR 61-479) Unclassified report

DESCRIPTORS: (*Liquefied gases, *Oxygen, Chemical reactions with *Titanium, *Combustion, Pressure.) (Oxidation inhibitors, Hydrogen compounds, Fluorides gas or Argon and Coatings of Phosphates or Vapor plating, Aluminum.) Liquid rocket propellants, Metals.

A mechanism for the LOX-Ti reaction was previously proposed (WADD TR 60-258). It was postulated that the impact of a Ti surface immersed in LOX generates sufficient heat to gasify a pocket of O. In addition, the impact tends to compress the O at the local impact sites. A rapid reaction occurs at the fresh surface formed by the impact. Test results established that a fresh Ti surface, formed by rupture of a tensile specimen, reacted in gaseous O under approximately 100 psig pressure at temperatures as low as about -250 F. These results tend to substantiate the proposed mechanism. Means of eliminating or minimizing the reaction of Ti when ruptured in gaseous O were investigated. The addition of HF as a gas to the O resulted in some inhibition. Ar reduced the reactivity of O gas by dilution. Coating the tensile specimens with fluoride-phosphate or with vapor-deposited Al did not affect the reactivity. These same coatings furnished some protection to Ti from reactivity during impact under LOX. (Author)

AD-273 490 Div. 10, 16
(TISTB/CCH) OTS price $.50

Army Chemical Research and Development Labs., Army Chemical Center, Md.
VAPOR TOXICITY OF UDMH IN RATS AND DOGS FROM

SHORT EXPOSURES.
Rept. for Apr 60-May 61 on Health Hazards of Materials and Radiation,
by Maurice H. Weeks, George C. Maxey and others.
Oct 61, 15p. incl. tables, 10 refs.
(Proj. 7165)
(ASD TR 61-526) Unclassified report

DESCRIPTORS: (*Methyl hydrazines, Respiration, Dosage, Laboratory animals, Survival.) (*Toxicity, Stress (Physiology), Pathology, Nervous system.)

A study was made of the inhalation toxicity of UDMH in animals from single short exposures. Five- to sixty-minute exposure of dogs and rats to high concentrations of UDMH produce toxic signs similar to those seen at longer inhalation exposures. No clinical abnormalities resulted from these single short-term exposures. Dogs exposed to 50, 200, and 600 ppm of UDMH for single or multiple 60-, 15-, and 5-minute periods, respectively, showed no adverse physiological effects. These levels of UDMH should serve as a basis from which short-term exposure standards may be estimated for man. (Author)

AD-273 629 Div. 10, 4
(TISTM/TCG) OTS price $5.60

Louvain U. (Belgium).
A KINETIC STUDY OF HYDROCARBON-OXYGEN-NITROGEN FLAMES.
Final technical rept. no. 1,
by A. Van Tiggelen. Feb 62, 37p. illus. tables, 30 refs.
(Grant no. AF-EOARDC-61-23)
(AFOSR-2391) Unclassified report

DESCRIPTORS: (*Reaction kinetics, Chemical reactions, Combustion, Mixtures, *Hydrocarbons, *Oxygen, *Nitrogen, *Flames.) (Energy, Chemical bonds, *Flame propagation, Temperature.) (Butanes, Pentanes.) Ethylene oxide, Fuels.

A comparative study was made of flame properties (burning velocities, flame front thickness and flame temperatures) in mixtures containing O and one of the following fuels; isobutane, neopentane or butane. The results indicated a correlation between the strength of the C-H bonds, and the over-all activation energies derived from burning velocities measured either at increasing dilution or at different preheating temperatures. An estimation of the mean molecular weight of chain carriers is derived from the values of the flame front thickness; the values obtained give some information about the stability of the alkyl radicals which are formed by H abstraction from the fuel molecule. An appendix contains a similar study on the ethylene oxide-O-N flames. There appears to be no essential difference between the burning of C_2H_4O and hydrocarbons; activation energy and molecular weight of chain carriers have normal values. (Author)

AD-273 675 Div. 10
(TISTM/EJH) OTS price $17.50

Aerospace Corp., El Segundo, Calif.
PROPELLANT PERFORMANCE AND GAS COMPOSITION HANDBOOK,
by S. A. Johnston, E. A. Mathias and others.
3 Jan 62, 1v. incl. tables (Rept. no. TDR-930(2210-07)TN-1)
(Contract AF 04(647)930)
(DCAS TDR 62-2) Unclassified report

DESCRIPTORS: (*Liquid rocket propellants, *Rocket oxidizers, Rocket motors, *Specific impulse, Mathematical analysis.) (Liquefied gases, Oxygen, Nitrogen compounds, Tetroxides, Hydrazines, Methyl hydrazines, Ammonia, Chlorides, Perchloryl radicals, Fluorine, Fluorides, Pentaboranes, Hydrogen, Hydrogen compounds, Peroxides, Perchlorates.) *Handbooks, Tables.

Performance tables are presented which were obtained by plotting data from machine calculations and interpolating to obtain vacuum specific impulses for integral values of the area ratio. The values are convenient reference points for the calculation of interpolated values of the specific impulse for any given area ratio. Tables of gas compositions and performances are also included in this handbook. (Author)

AD-273 684 Div. 10, 22
(TISTP/WH) OTS price $5.60

California U., Berkeley.
INTERFEROMETRIC OBSERVATION OF FLAME ACCELERATION IN AN EXPLOSIVE GAS,
by A. J. Laderman, P. A. Urtiew and A. K. Oppenheim. Feb 62, 1v. incl. illus. tables, 16 refs. (Technical note no. DR 12)
(Contract AF 49(638)166)
(AFOSR-2191) Unclassified report

DESCRIPTORS: (*Interferometers, *Photographic analysis of Ignition and Detonation of Gases.) (*Mixtures of Hydrogen and Oxygen.) (Acceleration of *Flames in Explosive gases.)

Flash photographs of the transition from deflagration to detonation were obtained by means of the Mach-Zehnder interferometer. Experiments were performed using stoichiometric hydrogen-oxygen mixtures in a 1.0 by 1.5 inch detonation tube with three methods of ignition: spark discharge, pilot flame, and glow coil. In all cases the ignitor was located at the closed end of the tube. For each set of operating conditions, a series of flash interferograms were taken, one on each experiment, which were pieced together on a single time-space plane to yield a cinematographic representation of the process. The individual interferograms revealed considerable information on the shape of the flame front and on the structure of the reaction zone, while the sequence of photographs yielded an insight into the breakdown of the combustion front from a laminar to a turbulent flame. (Author)

AD-273 792 Div. 10, 12, 25
(TISTA/SEB) OTS price $4.60

Aeronutronic, Newport Beach, Calif.
AN EXPERIMENTAL PROGRAM FOR OBTAINING THE THERMODYNAMIC PROPERTIES OF PROPELLANT COMBUSTION PRODUCTS.
Quarterly technical summary rept. no. 3,
by D. L. Hildenbrand, L. P. Theard, and N. D. Potter. 15 Mar 62, 49p. incl. illus. tables, 29 refs. (Publication no. U-1606)
(Contract NOw 61-0905-c)
Unclassified report

DESCRIPTORS: (Thermodynamics, *Solid rocket propellants, Combustion, Combustion chamber gases.) (Vaporization, Vapor pressure of *Boron compounds, Oxides, *Lithium compounds, Oxides, Lithium compounds, Borates, *Beryllium compounds, Fluorides.) (Specific heat, Measurement, Test methods, Tantalum, Tests.) (Mass spectroscopy of Boron compounds, Oxides, Magnesium compounds, Fluorides, Ionization.) (Data, Tables.)

Torsion vapor pressure studies on LiO and B_2O_3 were completed. For Li_2O, pressures measured

over the range 1480 to 1670 K are higher than calculated elemental decomposition pressures by a factor of about 2.7. The vapor pressure of B2O3 was measured in the range 1400 to 1570 K. A vibrational frequency assignment for B2O3 (g) based on matrix isolation spectra yields for the reaction B2O3 (1) equals B2O3 (g), an average third-law delta H(298) of 98.7 kcal/mole and a second-law value of 99.4 kcal/mole. A corresponding analysis using thermal functions based on vapor emission spectral data leads to second- and third-law delta H(298) values of 101.2 and 91.7 kcal/mole, respectively. The heat of formation of B2O3 (g) at 298 K is derived as -202.0 kcal/mole. The vaporization of BeF2 was studied by the torsion-effusion method in the range 810 to 945 K. Second- and third-law methods were used to derive the heat of sublimation of BeF2 at 298 K as 58.0 kcal/mole, leading to a heat of formation of -183.2 kcal/mole for BeF2 (g). (Author)

AD-273 886 Div. 10
(TISTA/WAW) OTS price $1.60

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
ON THE BURNING MECHANISM OF AN ATOMIZED LIQUID FUEL IN A TURBULENT STREAM,
by S. M. Kogarko and V. Ya. Basevich. 27 Feb 62, 13p. incl. illus. table, 5 refs. (Trans. no. FTD-TT-62-190 of Izvestiya Akademii Nauk SSSR, Metallurgiya i Toplivo, No. 4, pp. 1377142, 1961)
Unclassified report

DESCRIPTORS: (*Fuel sprays into *Turbulent flow, *Combustion of Benzenes, Jet mixing flow, Spectrographic analysis, Chemical analysis, Measurement.)

An evaluation was made of the vapor concentration of an atomized liquid fuel in the flame zone and the mechanism of its decrease was studied. In a range of initial temperatures of 20 to 320 degrees, flow rates from 12 to 98 m/sec, and at various mixture compositions and droplet dimensions, the following was found: (1) The burning mechanism is diffusionary relative to the fuel droplets. No disturbances of this mechanism which would lead to vapor accumulation in the flame zone were discovered. (2) When fuel vapor forms before the flame zone, its burning can take place by joint diffusion with oxygen to the droplet burning zones, or with the formation of an independent vapor-burning zone. (3) When burning lean mixtures, previous partial vaporization of fuel is permissible only if it leads to the formation of an independent burning zone. (Author)

11. GROUND TRANSPORTATION EQUIPMENT

AD-273 487 Div. 11, 30, 33
(TISTE/NTM) OTS price $2.60

Ordnance Tank-Automotive Command, Detroit, Mich.
GENERATION OF ROAD PROFILES FOR VEHICLE RIDE SIMULATIONS,
by Mary Archambault, Sam Heal, and Stephen Staich. 15 Sep 61, 25p. incl. illus. (Rept. no. RR-44) (Proj. 572-01-001)
Unclassified report

DESCRIPTORS: (Terrain, *Roads, *Vehicles, Motion, Simulation on *Digital computers.) *Vehicle wheels, *Programming, Computers.

A technique is presented for generating the road profiles and terrain conditions required for realistic computer simulation studies of vehicle behavior and motion response. It is concerned with: (1) developing digitally the data which must be presented sequentially to each wheel of the simulated vehicle, and (2) converting these numerical inputs to equivalent voltage inputs for the analog model. (Author)

AD-273 515 Div. 11, 18, 12, 26, 29, 33
(TISTE/NTM) OTS price $21.00

Assistant Secretary of Defense, Research and Engineering, Washington, D. C.
SHOCK, VIBRATION AND ASSOCIATED ENVIRONMENTS. PART III.
Feb 62, 352p. incl. illus. tables, refs. (Bulletin no. 30, pt. 3)
Unclassified report

The 30th Symposium on Shock, Vibration, and Associated Environments was held at the Statler-Hilton Hotel, Detroit, Michigan on October 10-12, 1961.

DESCRIPTORS: (*Symposia, *Shock, *Vibration, *Packaging, *Transportation, Measurement, Simulation, Design.) (Railroads, Railroad tracks, Railroad cars, Cargo, Shipping.) (*Military transportation, Cargo vehicles, Terrain, Roads, Sails.) (Packaging, Containers, Storage, Materials, Foam rubber, Foams, Cellulose, Handling, Guided missiles, Nuclear power plants, Design, Trailers, Electronic equipment.) (Air transportation, Air drop operations, Airborne, Containers.)

Contents:
Measurement and definition of transportation environments
Isolation of packaged items
Simulation of transportation environments
Design of containers and transporters
Aerial delivery of supplies and equipment
Panel session I
Engineering approach to the protection of a fragile item

AD-273 712 Div. 11, 22
(TISTW/JRG) OTS price $1.10

Ordnance Mission, White Sands Missile Range, N. Mex.
LITTLEJOHN. ROAD TRANSPORTATION TESTS STRAIN INVESTIGATION OF LITTLEJOHN XM-449 TRAILER,
by Charles F. Falkenbach. Mar 62, 5p. incl. illus. table (Technical memo. no. 971) (Proj. 517-07-035)
Unclassified report

DESCRIPTORS: (Roads, Transportation, Tests of *Trailers for *Artillery rockets for the Determination of Structures, Stresses.) (Strain gages, Instrumentation.)

The XM-449 trailer was monitored for strain during road transportation tests conducted at the White Sands Missile Range, New Mexico. The max strain level recorded was 872 microin./in. It is concluded that the structural members of the trailer are capable of withstanding transportation within the limits of the investigation. (Author)

12. GUIDED MISSILES

AD-273 453 Div. 12, 2
(TISTA/VGW) OTS price $.75

National Aeronautics and Space Administration, Washington, D. C.
PAPERS ON ANALYSIS OF ORBITS,
by Yu. V. Batrakov, A. S. Sochilina and others. Mar 62, 29p. incl. illus. tables, 6 refs. (Technical trans. no. F-74 from Bulletin of the Stations for Optical Observation of Artificial Earth Satellites, no. 7(17), 1960)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical trans. no. F-74.

DESCRIPTORS: (*Satellite vehicle trajectories, Orbital flight paths of USSR, Satellite vehicles, Celestial mechanics, Optical tracking, Optical equipment, Mathematical analysis, Tables, Data.) (Translations, USSR.)

AD-273 479 Div. 12
(TISTA/WAW) OTS price $2.60

Aerospace Corp., El Segundo, Calif.
TAKE-OFF FROM A CIRCULAR ORBIT BY LOW-CIRCUMFERENTIAL THRUST,
by B. Billik. 24 Jan 62, 21p. 6 refs. (Rept. no. TDR-930(2560-40)TN-1)
(Contract AF 04(647)930)
(DCAS TDR 62-27) Unclassified report

DESCRIPTORS: (Satellite vehicles, Spaceships, *Orbital flight paths, Separation, Take-off, Space flight, *Celestial mechanics, Dynamics, Mathematical analysis, Differential equations, Integral equations, Bessel functions, Perturbation theory.) (Motion, Equations.)

The motion of a satellite, initially in a circular orbit about the earth and traveling under the action of a constant circumferential acceleration, is analyzed. The radius and angular momentum of the vehicle are obtained as functions of the time. These expressions are accurate over most of the trajectory before escape conditions are met. Due to the complexity of these equations, a set of simplified expressions for the radius, angular momentum, radial velocity, speed, and flight path angle are also obtained. The simplified equations are more amenable to computation but are accurate over a more restricted range of radial distance. These latter equations indicate a damping out of periodic terms as the vehicle recedes from the earth. The approach utilized is believed unique insofar as its application to low thrust problems is concerned. Specifically, the equations of motion are linearized by introducing a new variable, defined as the difference between the square of the instantaneous angular momentum of the actual orbit and that of a circular orbit at the instantaneous radius. The linearized equations are then solved for this quantity as a function of the time. This new variable might find application in attempts to solve other perturbative problems related to satellites initially in circular orbits. (Author)

AD-273 537 Div. 12, 6, 2
(TISTW/EET) OTS price $1.60

Aerospace Information Div., Washington, D. C.
TRACKING OF MISSILES AND SPACE VEHICLES. REVIEW OF SOVIET LITERATURE.
Monthly rept. no. 16, Dec 61-Jan 62.
15 Feb 62, 9p. 11 refs. (AID rept. no. 62-26)
Unclassified report

DESCRIPTORS: (*Satellite vehicles, *Guided missiles, Surface to surface, Radar tracking, Radio interferometers, *Tracking.) *Plasma physics, *Electromagnetic fields, Wave transmission, Electromagnetic waves, Magnetohydrodynamics, *Ionospheric disturbances, Ions, Ionosphere, Upper atmosphere, *Radio astronomy, Radio waves, Extraterrestrial radio waves, Antenna radiation patterns, USSR.

Contents:
- Electromagnetic problems
  - Magnetoacoustic oscillations and induction pinch instability
  - Problems of L-F wave propagation in a pinched viscous plasma along a magnetic field
  - On the theory of electromagnetic fluctuations in a plasma
  - Investigation of pinch-effect dynamics in a magnetic field
- Ion clouds and ionosphere perturbations
  - Measurement of radio-wave absorption in the presence of large ionospheric inhomogeneities
- Radio astronomy
  - Lunar radio emission on the 3.2-cm wavelength
  - Calibration of lunar radio emission on the 3.2-cm wavelength
  - Radio emission from the Taurus-A region on the 8-mm wavelength
  - Observations of lunar thermal radio emission on the 2-cm wavelength
  - Radioastronomical observations of Soviet space rockets
  - Investigation of radiation characteristics of pencil-beam image antennas with reflectors of variable cross section

AD-273 555 Div. 12, 14
(TISTA/LSK) OTS price $6.60

Applied Physics Lab., Johns Hopkins U., Silver Spring, Md.
THERMAL ENGINEERING OF THE TRANSIT SATELLITES,
by L. D. Eckard, Jr. Sep 61, 61p. incl. illus. table, 9 refs. (Rept. no. CM-1001)
(Contract NOrd-7386)
Unclassified report

DESCRIPTORS: (*Satellite vehicles, *Navigation.) (Space environmental conditions, *Thermal insulation, *Temperature control, Heat transfer, Thermal conductivity, Radiators, Coatings, Heat resistant paints.) (Surfaces, Temperature.)

Problems and solutions of thermal engineering for the Transit 1A through 3B experimental satellites, as well as the satellite space environment factors affecting external and internal temperatures, are presented. Important variables available to the designer for controlling satellite temperatures are discussed, including surface coatings, vehicle shape and orientation, orbital parameters, and launching conditions. A simple method for the calculation of the

maximum transient temperature excursions of the satellite skin is outlined. A rapid graphical method for the calculation of satellite mean skin temperatures is presented. These simplified treatments should be useful for preliminary satellite thermal design work. (Author)

AD-273 564 Div. 12
(TISTA/WAW) OTS price $ .75

National Aeronautics and Space Administration, Washington, D. C.
AN EXPERIMENTAL TECHNIQUE FOR THE INVESTIGATION OF TIPOFF FORCES ASSOCIATED WITH STAGE SEPARATION OF MULTISTAGE ROCKET VEHICLES,
by Robert L. Gungle, William S. Brosier, and H. Wayne Leonard. Mar 62, 29p. incl. illus. 6 refs. (NASA Technical note D-1030)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical Note D-1030.

DESCRIPTORS: (*Satellite vehicles, *Space probes, Rocket motors, Booster rockets, Errors in Flight paths due to Staging, Separation.) (Simulation of *Staging, Test facilities, Design, Dynamics, Mathematical analysis, Differential equations, Integral equations.) (Experimental data, Mathematical analysis.)

A technique is presented whereby tipoff disturbances which may occur during high-altitude stage separation of a multistage rocket vehicle may be readily determined from ground firings under laboratory conditions. Methods are presented for the evaluation by dynamic simulation of the combined dynamic effects of several variables arising from the proximity of the separated lower stage and the firing upper stage motor. Expressions governing mass parameters are derived and presented in terms of relative total accelerations of the two bodies, and a discussion relating geometric parameters to the general simulation problem is given. Appropriate equations are derived which permit the conversion of observed displacements to total tipoff impulse. (Author)

AD-273 630 Div. 12, 6
(TISTA/VGW) OTS price $2.60

Naval Research Lab., Washington, D. C.
OPTICAL CALIBRATION OF THE U. S. NAVAL SPACE SURVEILLANCE SYSTEM,
by L. O. Hayden. 14 Mar 62, 18p. incl. illus. tables (NRL rept. no. 5741)
Unclassified report

DESCRIPTORS: (*Satellite vehicles, Communication systems, Balloons, Calibration, Tests of Radio interferometers, Tracking and Optical tracking with *Ballistic cameras, Mathematical analysis of Errors, Satellite vehicle trajectories.)

A project was initiated in the spring of 1960 to calibrate the Space Surveillance System by means of ballistic cameras. The principle behind this calibration is a comparison between the positions of the Echo balloon as determined by radio-frequency reflections of the Space Surveillance System and as determined by photographs against a star background. The preliminary results show that all stations have zero errors of less than 0.1 degree at the zenith. A second error having a standard deviation of about 0.05 degree is due in part to the limited precision of measurement used. The report describes the work done prior to the second phase of calibration, that phase leading to a much higher precision. (Author)

AD-273 680 Div. 12, 2, 15
(TISTP/MFA) OTS price $3.60

Air Force Proving Ground Command, Eglin Air Force Base, Fla.
ON THE REPRESENTATION OF AIR DENSITY IN SATELLITE DECELERATION EQUATIONS BY POWER FUNCTIONS WITH INTEGRAL EXPONENTS.
Rept. on Proj. Space Track,
by M. H. Lane, P. M. Fitzpatrick, and J. J. Murphy. Mar 62, 27p. incl. illus. tables, 14 refs. (Rept. no. APGC TDR 62-15)
Unclassified report

DESCRIPTORS: (Density of Air in *Satellite vehicles, Orbital flight paths, *Deceleration, Equations.) (*Hydrostatic pressure, Gas flow, Perturbation theory.) (Functions, Polynomials, Integral equations.)

The scale height in height-bands between 150 and 400 km is assumed to vary linearly with height. Integration of the hydrostatic equation for an ideal gas above a spherical earth then leads to a power function representation of the air density over the band. With integral exponents such power laws give better fits to several proposed model atmospheres over altitude ranges of several hundred kilometers than those provided by the usual exponential representation of air density. The representation of air density in satellite deceleration equations by power functions with integral exponents reduces them to elementary forms. It was possible with such density distributions to obtain simplified formulas which may be useful for (a) computing atmospheric densities from satellite accelerations, (b) comparing proposed model atmospheres with observations, and (c) developing the theory of satellite orbits in the presence of air drag. As is possible with the exponential form, these power functions may be modified to take account of the effect of an oblate, rotating atmosphere. Their use may, therefore, permit the development of a simplified, accurate orbit theory for satellites with perigee heights below 300 km. Certain preliminary results are discussed and compared with previous theory and observations. (Author)

AD-273 726 Div. 12, 2
(TISTA/VGW) OTS price $3.60

RAND Corp., Santa Monica, Calif.
PERTURBATIONS OF A SYNCHRONOUS SATELLITE DUE TO THE TRIAXIALITY OF THE EARTH,
by R. H. Frick and T. B. Garber. Jan 62, 30p. incl. illus. 2 refs. (Research memo. no. RM-2996-NASA)
(Contract NASr-2102)
Unclassified report

DESCRIPTORS: (*Satellite vehicles for Communication systems, Orbital flight paths, Stabilization, Perturbation theory, Celestial mechanics.)

An investigation was made of the behavior of a synchronous (24-hour) satellite as affected by the triaxiality of the earth. This includes not only the effect of the equatorial bulge but also the ellipticity of the earth's equatorial section. The results indicate that there are only two positions on the equator (123 degrees 9 min. West Longitude and 56 degrees 51 min. East Longitude) at which a truly synchronous satellite can exist in a stable condition. To establish a synchronous satellite at any other longitude, station-keeping propulsion of the order of 51 fps for each year of operation would be required.

If no station-keeping propulsion is provided, the satellite will execute long period (greater than 1.3 years) oscillations about the closest of the two stable positions mentioned above. (Author)

AD-273 779 Div. 12, 31
(TISTW/EET) OTS price $5.60

Naval Weapons Lab., Dahlgren, Va.
TALOS STRUCTURAL FIRING TEST ABOARD THE USS LONG BEACH (CGN-9),
by P. P. Wiggins, T. I. Dodson and others.
30 Mar 62, 51p. incl. illus. tables, 4 refs.
(NWL rept. no. 1801)
Unclassified report

DESCRIPTORS: (Launching of Shipborne, Surface to air, *Guided missiles from *Cruisers.) (Measurement of Explosion damage from Booster rockets, Launching to Ship bulkheads, Ship decks, Personnel.) (Guided missile personnel, *Hazards, *Blast, Booster rockets.) (Measurement of Poisonous gases, Exhaust gases, Exhaust flames, Noise from Booster rockets.) *Naval vessels.

Six TALOS mk 11 mod 2 boosters with concrete slugs were fired aboard the USS Long Beach (CGN-9) to investigate the adequacy of the protection for Talos personnel against blast effects and to determine the effects of the booster blast on the ship's structure. The test vehicles were fired at various angles of train and elevation such that the exhaust stream was directed at areas thought to impose the most severe conditions on the ship's structural components and equipment. Measurements were made of structural strains, toxic gas concentrations, noise levels, flame penetrations at door and port seals, and temperature changes inside the ship and in the blast area of the 01 level and the main deck. High-speed motion pictures were taken on all tests. The results indicated minor gas leakage around the blast doors, toxic gas leakage into the ventilation systems, and minor structural damage to equipment mounted on the sides of the missile house and the main deck. (Author)

AD-273 811 Div. 12, 7
(TISTE/CRJ) OTS price $7.60

General Electric Co., Santa Barbara, Calif.
DESIGN OF A POWER SYSTEM FOR A LUNAR MOBILE SURFACE VEHICLE,
by R. H. Brody. 2 Oct 61, 73p. incl. illus. tables, 14 refs. (Rept. no. 61SPC-3)
Unclassified report

DESCRIPTORS: (*Lunar probes, Mobile, *Power supplies, *Auxiliary power plants.) (Solar cells of Silicon, Thermoelectricity, Nuclear power plants, Electric power production, Storage batteries, Primary batteries, Electrochemistry, Thermionic emission.) (Moon, Surface properties, Space environmental conditions, Exploration.)

Available power generators are examined to determine which are applicable to a lunar roving vehicle. Two classes of vehicles are of interest: a 300 lb. Surveyor type vehicle; a 3000 lb. Prospector type vehicle. It is concluded that a solar cell-battery combination is best and a design is presented for each vehicle, specifying important power system parameters. (Author)

AD-273 812 Div. 12, 5
(TISTE/CRJ) OTS price $4.60

General Electric Co., Santa Barbara, Calif.
COMMUNICATION SYSTEMS ANALYSIS FOR LIGHTWEIGHT ROVING LUNAR VEHICLE,
by G. L. Dunn. 2 Nov 61, 41p. incl. illus. tables, 5 refs. (Rept. no. 61 SPC-4)
Unclassified report

DESCRIPTORS: (*Lunar probes, Mobile, Communication equipment.) (*Radio communication systems, *Television communication systems, Data transmission systems, Pulse modulation, Coding, Mathematical analysis.) (Radiofrequency power of *Radio transmitters, Antennas for Radio receivers.) (Moon to Earth, Communication systems.)

Efforts were made to determine the transmitter power requirements as a function of data transmission rate for the Prospector moon-to-earth TV link. An analysis is presented based on the utilization of PCM-PS modulation at an RF carrier frequency of 2250 mc. The ground based receiver station utilizes the DSIF equipment. The video input is obtained from the output terminals of an image orthicon camera located aboard the tank. The maximum data rate assumed is 1.5 x 10 to the 6th power bits/sec, i.e., 1000 vertical lines, 500 horizontal lines and 8 levels of grey. The video output from the communications system consists of a train of binary pulses that will have a digit error of 1 in 100,000. (Author)

AD-273 815 Div. 12, 5
(TISTA/LSK) OTS price $4.60

General Electric Co., Santa Barbara, Calif.
SOME CONSIDERATIONS FOR A LUNAR BASED SURVEILLANCE SYSTEM,
by R. H. Brody. 28 Feb 62, 44p. incl. illus. 11 refs. (Rept. no. 61 SPC-10)
Unclassified report

DESCRIPTORS: (*Extraterrestrial bases, Moon, Exploration.) (Vehicles, Trafficability.) (Television cameras, Television equipment, Television guidance, Television display systems.) (*Camera tubes, Image tubes, Iconoscopes, Design.)

The report covers some factors that enter into the design of a television surveillance system for a lunar mobile vehicle. The first part is a review of illumination characteristics of the lunar surface in an attempt to define the scene parameters. The second part discusses the selection of a suitable pickup tube. The final portion presents some possible system configurations. Problems involved in lunar night operation are emphasized. (Author)

AD-273 888 Div. 12, 1, 2, 9, 16, 28
(TISTA/VGW) OTS price $17.00

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
SOVIET SATELLITES AND SPACE SHIPS (SELECTED ARTICLES),
by S. G. Aleksandrov and R. Ye. Federov.
23 Feb 62, 269p. incl. illus. tables (Trans. no.

Division 13 - INSTALLATIONS AND CONSTRUCTION
Division 14 - MATERIALS (NON-METALLIC)

FTD-TT-62-121 of Sovetskiye Sputniki i Kosmicheskiye Korabli, 2nd Edition, Moscow, Akademiya Nauk SSSR, pp. 24-82, 117-124, 144-147, 182-184, 217-242, 256-394, 427-456, 1961)
Unclassified report

DESCRIPTORS: (USSR, Translations on *Satellite vehicle research.) (*Satellite vehicle trajectories, Orbital flight paths, Life expectancy, Space flight to *Moon, Mars, Venus, Sun.) (Spaceships, Deceleration, *Re-entry aerodynamics.) (*Upper atmosphere, Geophysics, *Ionosphere.) (Photography of Moon, Van Allen radiation belt.) (Biology, Controlled atmospheres, *Closed-cycle ecological systems, Dogs, Manned, Pilots, Training, Aviation safety, Global flight.)

13. INSTALLATIONS AND CONSTRUCTION

No Entries

14. MATERIALS (NON-METALLIC)

AD-273 476 Div. 14, 17
(TISTM/GEC) OTS price $4.60

Aerospace Corp., El Segundo, Calif.
TRENDS AND FUTURE DEVELOPMENTS IN AEROSPACE MATERIALS,
by Leo E. Gatzek and James L. H. Peck. 15 Dec 61, 39p. incl. illus. tables, 22 refs. (Rept. no. TDR-930(2411)TN-1)
(Contract AF 04(647)930)
Unclassified report

Presented originally to the Air Force Aerospace Corporation Symposium on Ballistic Missile and Aerospace Technology held at the University of Southern California in August 1961.

DESCRIPTORS: (*Materials for Spaceships and Satellite vehicles, *Refractory materials, *Alloys, *Coatings, Metallic textiles, Solid rocket propellants, *Metals, Foams, Beryllium compounds, Oxides, Optics, Ablation, *Plastics, *Elastomers, Adhesives, Filament wound construction, Cryogenics, Shielding.)

Contents:
Refractory metals, superalloys, coatings, metal fabrics, metal fuels, foamed materials, translucent BeO, whiskers, composite materials, ablative plastic chars, elastomers and compliant materials, plastics development, organic and inorganic adhesives, filament windings, metals at cryogenic temperatures, measurement techniques, cushioning materials, shielding materials.

AD-273 558 Div. 14, 4, 12
(TISTM/EJH) OTS price $1.60

Midwest Research Inst., Kansas City, Mo.
SYNTHESIS AND EVALUATION OF BISBICYCLIC DIEPOXIDES.
Quarterly progress rept. no. 1, 15 Oct 61-15 Jan 62,
by Thomas M. Medved. 15 Feb 62, 11p. incl. illus.
(Contract NOw 62-0475-d)
Unclassified report

DESCRIPTORS: (*Heat resistant polymers, *Epoxy resins, *Epoxides, Polycyclic compounds, Heptanes, Octanes, Synthesis, Aging.) (*Aircraft finishes, Transparent panels, Optical coatings for Aircraft, Supersonics, Supersonic planes.)

Synthesis of bis(2-(bicyclo(2.2.1)heptane-5, 6-epoxy)-methyl) oxide (diepoxide 262) was accomplished. The intermediate ether was obtained by the Williamson synthesis. The diepoxide can be cured with maleic anhydride and trimethylolethane to form a hard infusible resin. However, the resin obtained from this curing system is dark brown. A thin film of this same resin cured between salt plates was colorless. Curing temperature differences may account for the color differences noted between the two samples. Cure of 5,6-epoxy bicyclo(2.2.2)octane-2-methyl-5',6'-epoxy bicyclo(2.2.2)octane-2-carboxylate, synthesized during an earlier program, with maleic anhydride and trimethylolethane yielded a dark brown, brittle, thermoplastic material. (Author)

AD-273 561 Div. 14, 26
(TISTM/GEC) OTS price $2.00

Material Lab., New York Naval Shipyard, Brooklyn.
DESIGN MANUAL FOR JOINING OF GLASS REINFORCED STRUCTURAL PLASTICS,
by A. Rufolo. Aug 61, 74p. incl. illus. tables, 31 refs. (Lab. proj. no. 6066-1; NAVSHIPS 250-634-1)
Unclassified report

DESCRIPTORS: (*Handbooks, *Laminates, *Plastics, Polymers, Esters, Reinforcing materials, Glass, *Bonding, Adhesives, Resin adhesives, *Joints, Bolts, Rivets, Metal screws.) (Laminates, Mechanical properties, Tensile properties, Thickness.) *Instruction manuals.

Glass reinforced plastic materials are currently being used for construction of: boat hulls; submarine fairwaters, masts and superstructures; minesweeping equipment; propeller shaft fairwaters and rope guards; as well as scores of other applications. The success of such applications is greatly dependent upon proper design of structural connections. This manual provides information and guidance on fastening techniques for reinforced plastic laminates. It is intended for the information and guidance of naval architects and marine engineers who design reinforced plastic structures for naval application. Areas discussed include: adhesives, screws, bolts, rivets, special fasteners, properties of structural laminates, theory and design. (Author)

AD-273 575 Div. 14, 4
(TISTM/EJH) OTS price $3.60

Frick Chemical Lab., Princeton U., N. J.
CHARACTERISTIC VISCOELASTIC PARAMETERS FOR AMORPHOUS POLYMERS,
by A. E. Tobolsky and M. Takahashi. 26 Feb 62, 31p. incl. illus. tables, 5 refs. (Technical rept. no. RLT-41)
(Contract Nonr-185807, Proj. NR 356-377)
Unclassified report

DESCRIPTORS: (*Polymers, Butenes, Styrenes, Ethylenes, Sulfides, Propenes, Furan, Butadienes, Rubber, Acrylic resins.) (Deformation, *Viscosity, *Elasticity, Stresses, Relaxation time, Temperature.) Tables.

Using a reference value of modulus equal to 10 to the 9th power dynes/sq cm, and a reference value of time equal to 10 sec, characteristic viscoelastic parameters are defined from stress relaxation master curves and from modulus temperature curves. Values of these parameters are tabulated for several linear amorphous polymers and for slightly cross linked amorphous polymers. (Author)

AD-273 582 Div. 14, 17
(TISTM/GEC) OTS price $5.60

Southern Research Inst., Birmingham, Ala.
THE DEVELOPMENT OF HEAT-RESISTANT PAINTS FOR METALS.
Bimonthly progress rept. no. 6, 1 Dec 61-31 Jan 62,
by Stanley E. Mileski and A. E. Raeuber.
27 Feb 62, 48p. incl. illus.
(Contract NOw 61-0546-d)
Unclassified report

DESCRIPTORS: (*Heat resistant paints, Preparation from Metallic compounds, Zinc compounds, Oxides, Methyl radicals, Hydrogen compounds, Phosphites, Ethyl radicals, Phosphates, Processing, Aging.) (*Coatings for *Metals, Organic coatings, Ceramic coatings, Phosphate coatings, Zirconates, Titanates, Stannates.) (Tests, Resistance, Temperature, Water, Weatherproofing, Hardness, Bonding, Surface properties.)

Research continued on the ZnO-dimethyl hydrogen phosphite (DMHP)-ethyl acid phosphate (EAP) coating system. The relative humidity and temperature during curing were important in developing certain properties in these coatings. The methods of preparing and applying these coating compositions had a minor influence on coating properties. Addition of water improved some coating properties but impaired others; additions of various metal oxides or a colloidal SiO2 dispersion did not improve coating properties. The study of frits in phosphorus-bonded coatings showed that relative humidity and temperature during curing were important. Benefits were indicated for the inclusion of BaO in a glassy matrix. Coatings prepared from the zirconates or titanates of Ba or Zn and organo-P compounds were heat resistant, but were deficient in hardness and in water resistance. The reaction for forming ZnO-DMHP-EAP coatings was mainly dependent on the activity of the phosphite. (Author)

AD-273 583 Div. 14, 17
(TISTM/GEC) OTS price $4.60

Southern Research Inst., Birmingham, Ala.
THE DEVELOPMENT OF HEAT-RESISTANT PAINTS FOR METALS.
Final rept., 1 Feb 61-31 Jan 62,
by Stanley E. Mileski and A. E. Raeuber.
2 Mar 62, 38p. incl. tables.
(Contract NOw 61-0546-d)
Unclassified report

DESCRIPTORS: (*Heat resistant paints, Preparation from Metallic compounds, Zinc compounds, Oxides, Methyl radicals, Hydrogen compounds, Phosphites, Ethyl radicals, Phosphates.) (*Coatings for *Metals, Organic coatings, Ceramic coatings, Phosphate coatings, Zirconates, Titanates, Stannates, Tests, Thickness, Hardness, Surface properties, Bonding, Resistance, Temperature, Water, Weatherproofing.)

Studies were made of the effects of composition and conditions of application on the properties of heat-resistant paints that were cured at low temperatures by the reaction of organo-phosphorus compounds with metal oxides and ceramic frits. Formulations and coating procedures were developed that could produce coatings on metal substrates with any of the several target properties that were desired, but it was not yet possible to obtain all of these properties simultaneously and reproducibly. The most promising coatings were acid-phosphate. A number of metal oxides, ceramic frits, and organo-phosphorus compounds were investigated for use in phosphorus-bonded coatings. The ceramic frits, some metal zirconates, and bis(2-ethylhexyl) phosphite merited further study. Reaction mechanism studies indicated that the dimethyl hydrogen phosphite hydrolyzed and reacted with ZnO to form an amorphous polymeric product that is insoluble in organic solvents. (Author)

AD-273 645 Div. 14, 4
(TISTM/GEC) OTS price $5.60

Polytechnic Inst. of Brooklyn, N. Y.
SYNTHETIC POLYMER STUDIES RELATING TO ENZYMOLOGY.
Final rept., 1 Nov 60-31 Jan 62,
by J. Shafer and H. Morawetz. 28 Feb 62, 48p. incl. illus. tables, 4 refs.
(Contract Nonr-83931, Proj. NR 108-499)
Unclassified report

DESCRIPTORS: (*Polymers, Resins, Ion exchange resins, *Esters, *Amides, Organic acids, Synthesis, Chemical reactions, Reaction kinetics, Hydrolysis, Ions.) (Hydroxides, Methyl radicals, Anilines, Acetyl radicals, Amines, Ethyl radicals, Hydrogen compounds, Phthalates, Carboxylic acids, Phenyl radicals.) (Enzymes, Chlorinesterase.)

An attempt to synthesize a polymer with a specific affinity for cholinesterase by attaching m-hydroxy trimethylanilinium functions to the polymer backbone was abandoned. The hydrolysis of m-acetoxytrimethylanilinium iodide catalyzed by singly, doubly and triply ionized citric acid showed the doubly ionized citrate to have an anomalously low catalytic activity. The hydrolysis rate of B-N,N-dimethylamino ethyl hydrogen phthalate was studied over a range of pH values. The base catalyzed hydrolysis rate of phthalamide and methyl phthalamate was very high due to the attack of the conjugate base of the amide on the amide of ester function. The

hydrolysis rate of N-(o-carboxy) phenylphthalamic acid was studied over a range of pH values. The rate is a maximum when one of the 2 carboxyl groups is ionized. The hydrolysis of a compound carrying 2 cationic groups and 2 ester groups was studied in buffers and in partially ionized polymeric acids. The polyanions were found to act as powerful inhibitors for the hydroxyl ion catalyzed reaction. (Author)

AD-273 681 Div. 14, 8, 25
(TISTM/GEC) OTS price $2.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
AN EXAMINATION OF EPOXY SYSTEMS USEFUL IN PACKAGING HIGH G RADIO TELEMETERS,
by R. P. Young. Mar 62, 24p. incl. illus. tables, 13 refs. (Rept. no. AEDC TDR 62-58)
(Contract AF 40(600)800)
Unclassified report

DESCRIPTORS: (Hypervelocity guns, Telemetering, Radio, Packaging, *Embedding substances, Thermosetting resins, *Epoxy resins, Manufacturing methods, Aging, Density, Tests.)

The electrical components used in high g (500,000 g) telemetry packages will survive gun launchings only if potted in suitable materials. The materials considered for this application were: polyesters, epoxies, silicones, phenolics, and urethanes. The epoxy materials appeared to fulfill most of the requirements for this application. This report described epoxy materials, their curing, methods of potting, and the tests performed to select an epoxy material for embedding telemetry packages launched from hypervelocity guns in aeroballistic ranges. (Author)

AD-273 714 Div. 14, 17
(TISTM/EJH) OTS price $2.60

Naval Weapons Plant, Washington, D. C.
APPLICATION OF THIN FILMS OF POLYTETRAFLUOROETHYLENE COATINGS ON FERROUS MATERIAL,
by J. H. Thompson and C. L. Scott. 15 Oct 59, 23p. incl. illus. tables, 6 refs. (Rept. no. NWPW-T-32-59)
(NAVORD rept. no. 6948)
Unclassified report

DESCRIPTORS: (*Steel, *Coatings, *Plastic coatings, Resins, Polymers, Fluorides, Ethylenes, Surfaces, Sandblasting, Adhesion, Corrosion inhibition, Lubrication, Tests.)

Sandblasted and unsandblasted SAE 1020 steel panels were prepared for Teflon coatings. The surface roughness of the sandblasted panels was increased over the original surface roughness, up to a roughness height rating of 270 microinches. All of the steel panels were coated with Teflon and then examined for quality of the coating. Three Teflon coating systems were used. The Teflon adhered well, up to a roughness height rating of 180 microinches, when the coated panels were subjected to a load. The coated panels, when exposed to an accelerated corrosion test, showed corrosion products after 24 hr. Data obtained in this investigation was used to revise NAVORD OD 10362, and is included as an appendix to this report. NAVORD OD 10362 is subject to additional changes as a result of current work. (Author)

AD-273 716 Div. 14, 25
(TISTM/JRG) OTS price $.75

Naval Research Lab., Washington, D. C.
THE PROPERTIES OF PAINTS AS AFFECTED BY ULTRAVIOLET RADIATION IN A VACUUM. PART 2. Interim rept.,
by D. E. Field, J. E. Cowling, and F. M. Noonan. 8 Mar 62, 28p. incl. illus. tables, 10 refs.
(NRL rept. no. 5737)
Unclassified report

DESCRIPTORS: (Radiation effects of *Ultraviolet radiation in a Vacuum on *Plastic paints and *Plastic coatings containing Zinc compounds, Sulfides, Aluminum, Titanium compounds, Dioxides, Lead compounds, Carbonates, Silicone resins, Acrylic resins.) (*Organic coatings for Control of Temperature within Spaceships.) (Reflection of Ultraviolet radiation.) (Optics, Organic coatings.)

Organic coatings are being studied as one possible means of achieving temperature control within space vehicles; however, their usefulness in the space environment is limited by their physical and chemical stability in space. It is shown that the optical properties of most organic coatings are changed on exposure to intense UV radiation in high vacuum. Of the reflective pigments studied, those containing zinc sulfide and leafing aluminum are shown to be most stable in this radiation. (Author)

AD-273 720 Div. 14, 25
(TISTM/EJH) OTS price $5.60

Plastics Lab., Princeton U., N. J.
THE PHYSICO-CHEMICAL ASPECTS OF ORGANIC SEMICONDUCTORS,
by H. A. Pohl. 1 Feb 62, 53p. incl. illus. tables, 176 refs. (Technical rept. no. 64C)
(Contract DA 36-039-sc-89143, Proj. 3A99-15-001)
Unclassified report

DESCRIPTORS: (*Organic materials, *Semiconductors, *Organic compounds, Polymers, Conductivity, Electrical properties, Theory, Solid state physics.) Benzenes, *Bibliography.

A literature review of studies on organic semiconductors is presented. There are certain aspects of the electronic behavior of both monomeric and polymeric semiconductors which need considerable enlightenment. These include the origin of the activation energy observed for the conduction processes, the high conductivities of incompletely crystalline materials, and the low sensitivity to impurity (and possibly to morphology) exhibited by large numbers of organic semiconductors. In comparing the organic semiconductors with the best examples of the inorganic ones, it should be noted that while overall conductivities for either class of material can be made quite large and comparable with the conductivites of some metallic substances, the organic semiconductors have not as yet been prepared with the high mobilities characteristic of the highest quality inorganic semiconductors. Certain attributes of the presently available organic semiconductors such as high pressure sensitivity of certain organic resistors may offer some advantage. (Author)

AD-273 724 Div. 14, 25
(TISTM/EJH) OTS price $5.60

Plastics Lab., Princeton U., N. J.
SEMICONDUCTION IN METAL-DOPED PYRO-POLYMERS,
by S. L. Rosen and H. A. Pohl. 15 Jan 62, 54p. incl. illus. tables, 27 refs. (Technical rept. no. 64B)
(Contracts DA 36-039-sc-89143 and DA 36-039-sc-78105, Proj. NR 356-375)
Unclassified report

DESCRIPTORS: (*Ion exchange resins, Chemical impurities, Ions, Sodium, Calcium, Thorium, Nickel, Aluminum, Pyrolysis, Temperature, Conductivity, Resistance, Hall effect, Pellets.) (*Semiconductors, Polymers, Thermoelectricity.)

The electronic properties of pyrolysis products of Na-, Ca- and Th-doped ion-exchange resins were investigated. The resulting pyro-polymers were degenerate semiconductors whose resistivities decreased from approximately 0.1 to 0.01 ohm-cm as the pyrolysis temperature increased from 800 to 1200 C. Resistivities were altered roughly by a factor of 2 with appropriate doping. The materials exhibit the negative resistivity-temperature behavior common to semi-conductors, and have small (.005 to .05 ev) energy gaps. Small, negative (0 to -.05 cc/coul) Hall coefficients were observed. Carrier concentrations are estimated at approximately 1 to 3 x 10 to the 20th power/cc, with mobilities of 1 to 4 sq cm/volt-sec. (Author)

AD-273 746 Div. 14, 17, 26
(TISTM/BRW) OTS price $2.60

Thompson Ramo Wooldridge, Inc., Cleveland, Ohio.
DESIGN DATA STUDY FOR COATED COLUMBIUM ALLOYS.
Bimonthly technical progress rept. no. 1, 21 Dec 61-21 Feb 62,
by J. D. Gadd. 21 Mar 62, 23p. incl. illus. tables (Rept. no. TM-3362-67)
(Contract NOw 62-0098-c)
Unclassified report

DESCRIPTORS: (*Coatings, Refractory coatings, *Oxidation inhibitors, Silicon coatings, *Niobium alloys (D-14), Zirconium alloys, Sheets, Tests.) (Coatings of Silicides, Aluminum and Alloys.) High temperature research, Spaceships, Re-entry vehicles, Structures, Refractory materials.

Progress is reported on preparations for the preliminary screening evaluation of 7 current Nb coatings applied to 30 mil Nb-5Zr alloy sheet. Sheet material for the preliminary evaluation was obtained, test parameters were established and specimens were submitted to various organizations for coating. The preliminary screening tests established will involve the determination of oxidation protective life and bend transition temperatures for each of the 7 coating-base metal systems in the as coated, as exposed (2000 and 2600 F) and prestrained (room temperature) and exposed (2000 and 2600 F) condition. Baseline data for the 30 mil Nb-5Zr alloy sheet were experimentally established. Brittle to ductile bend transition temperatures were determined for the uncoated sheet in the as received, stress relieved and heat treated conditions and after exposure in air at 2000 and 2600 F for various short time periods. Surface recession and internal penetration oxidation measurements were made on the uncoated sheet. A brief discussion is presented of the design data tests proposed and specialized equipment being constructed. (Author)

AD-273 801 Div. 14, 17
(TISTM/GEC) OTS price $8.10

Chance Vought Corp., Dallas, Tex.
PHYSICAL PROPERTIES OF SOME ENGINEERING MATERIALS. UNPUBLISHED DATA FROM COMPANY SPONSORED PROGRAMS.
Quarterly rept. no. 4, vol. 2 on Phase 1, 1 Dec 61-28 Feb 62,
by J. J. Peterson. 15 Mar 62, 77p. incl. illus. tables (CVC rept. no. 2-53420/2R374)
(Contract AF 33(616)7986)
Unclassified report

DESCRIPTORS: (Materials, *Physical properties, Thermodynamics, Corrosion, Mechanical properties, Test methods.) (*Ablation, *Coatings, Electric insulation, *Glass textiles, *Graphite, Laminates, Encapsulation, Embedding substances, *Zirconium compounds, Dioxides.) (*Stainless steel (PH15-7Mo), Honeycomb cores, Sandwich panels.) (*Tool steel (MGR punch and die, Olympic FM die, Select B die, Jet forge tool, Vasco 7152 tool, CK special tool), Dies.)

Physical property data and some mechanical properties data are reported for ablation materials, electrical coatings, fiberglas, graphite, laminates, potting compounds, steel and ZrO2. (Author)

AD-273 802 Div. 14
(TISTM/GEC) OTS price $9.10

Chance Vought Corp., Dallas, Tex.
A CORRELATION OF PROPERTIES FOR VARIOUS FORMULATIONS OF SINTERED ZIRCONIA. UNPUBLISHED DATA.
Quarterly rept. no. 4, vol. 3 on Phase 1, 1 Dec 61-28 Feb 62,
by D. T. Lowrance. 15 Mar 62, 95p. incl. illus. tables, 8 refs. (CVC rept. no. 2-53420/2R375)
(Contract AF 33(616)7986)
Unclassified report

DESCRIPTORS: (Sintered, *Zirconium compounds, *Dioxides, *Calcium compounds, *Zirconates, Yttrium compounds, Oxides, Cerium compounds, Refractory materials, Ceramic materials, High temperature research.) (Test methods, *Thermodynamics, Thermal stresses, Thermal expansion, Thermal conductivity, Black-body radiation, Specific heat, Melting, Crystal structure, Density, Porosity.) Tables, Mechanical properties, Physical properties.

This report consists of mechanical and physical properties data of various binary and ternary formulations of ZrO2, a correlation of measured thermal shock data of ZrO2 with known thermal shock expressions, and interpretations of various criteria that are developed. Measurements of the thermal shock, expansion, emittance, strength, thermal conductivity and heat capacity data were made. (Author)

AD-273 874 Div. 14, 12
(TISTM/EJH) OTS price $1.60

Aeronautical Electronic and Electrical Lab., Naval Air Development Center, Johnsville, Pa.
URETHANE FOAMS FOR AEROSPACE APPLICATION.
Technical note,
by H. R. Moore. 2 Mar 62, 28p. incl. illus. (Rept. no. NADC-EL-N6208)
Unclassified report

Presented at a symposium on Materials and Processes for use in the Space Age, sponsored by the Society of Aerospace Materials and Process Engineers, Philadelphia, Pennsylvania, 24 Oct 60.

DESCRIPTORS: (*Foams, *Expanded plastics, Polymers, *Urethanes, Manufacturing methods, Powders, Freezing, Low pressure research, Low temperature research.) (Satellite vehicles, Spaceships, Materials.) Cyanates, Halocarbons, Water.

Preliminary tests of one-part frozen urethane powders exposed in a high-altitude vacuum chamber operated at temperatures of -50 and 70 F have shown that a new group of triol-free branched polymers, esterified short of the critical degree of esterification, are capable of producing rigid foams with strength properties comparable to those obtained by high-temperature curing at atmospheric pressure. Controlled, reduced temperature, premixing of three categories of several two-part urethane systems, before rapid freezing in liquid nitrogen, was considered a significant factor in trapping sufficient exotherm of isocyanate cross-linking reactions to initiate foaming in a low-temperature and vacuum environment. (Author)

AD-273 880 Div. 14, 12, 1
(TISTM/BRW) OTS price $3.50

Southwest Research Inst., San Antonio, Tex.
HANDBOOK OF DESIGN DATA ON ELASTOMERIC MATERIALS USED IN AEROSPACE SYSTEMS.
Rept. for 5 Feb 60-30 June 61 of Design Data on Aircraft Elastomeric Materials and Products, by A. G. Pickett and M. M. Lemcoe. Jan 62, 222p. incl. illus. tables, 233 refs.
(Contract AF 33(616)7093, Proj. 7381)
(ASD TR 61-234) Unclassified report

DESCRIPTORS: (*Elastomers, Design, Data, *Handbooks, Processing, Casting, Plastic coatings, Vulcanization.) (Mechanical properties, Physical properties, Thermal conductivity, Electrical properties, Aging, Heat, Oxidation, Ozone.) (Compatibility with Petroleum, Fuels, Lubricants, Hydraulic fluids, Liquid rocket propellants, Rocket oxidizers, Rocket fuels.) (Radiation effects, Low pressure research, Vibration isolators, Seals, Springs.) (Elasticity, Plasticity, Stresses, Deformation, Shock resistance.) Airframes, Spaceships, Satellite vehicles.

This handbook provides aerospace weapons system design engineers with useful data on the materials properties of elastomers. The data sources are Department of Defense research reports and the technical literature of engineering design and elastomer technology. The elastomeric materials considered are compounds of high polymers currently available in the U. S. A. The properties considered are original mechanical and physical properties and their changes that result from aging and exposure to environments of aerospace weapons systems. Elastomer compounding is only briefly treated because the handbook is intended for use by structural and mechanical engineers rather than by rubber chemists and technologists. A selected bibliography of the technical literature is included. (Author)

AD-273 895 Div. 14, 26, 27
(TISTM/BRW) OTS price $3.60

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta.
HIGH TEMPERATURE CERAMIC STRUCTURES.
Quarterly rept. no. 22, 1 Nov 61-31 Jan 62, by N. E. Poulos, S. R. Elkins, and J. D. Walton. 31 Jan 62, 32p. incl. illus tables.
(Contract NOrd-15701, Proj. A-212)
Unclassified report

DESCRIPTORS: (*Ceramic materials, *Silicon compounds, Dioxides, Processing of *Radomes by Pressure, Casting and Impregnation with Aluminum compounds, Chlorides, Porosity, Mechanical properties.) (*Guided missile noses, Manufacturing methods.)

Effort was directed towards AlCl3 impregnating studies and radome fabricating studies. The AlCl3 studies were continued to determine the impregnating method that would increase the strength and decrease the porosity of slip-cast fused silica. Four different impregnating methods were evaluated and found effective in the following order: (1) simple exposure, (2) boiling, (3) vacuum-pressure, and (4) pressure. The order according to effectiveness in increasing transverse strength was (1) vacuum-pressure, (2) pressure, (3) simple exposure, and (4) boiling. The effects of surface skin (fine particles of fused silica developed during initial casting) removal were studied in conjunction with AlCl3 studies. In general, the removal of the surface skin decreased the strength of the slip-cast fused silica impregnated by 4 impregnating methods. The bulk diffusion rate and the tendency to develop closed pores was decreased. A procedure was developed for pressure casting radomes from fused silica slips that provided a casting time of 80 minutes, or a reduction of about 9 hr over conventional slip-casting procedures to form a 3/8-in.-thick x 15-in.-diam x 32-in.-high radome. (Author)

15. MATHEMATICS

AD-273 464 Div. 15
(TISTP/MFA) OTS price $5.60

Institute of Mathematical Sciences, New York U., N. Y.
GROUPS OF HOMOTOPY SPHERES, I,
by Michel A. Kervaire and John W. Milnor.
Dec 61, 37p. 33 refs. (Rept. no. IMM-NYU 292)
(In cooperation with Princeton U., Contract Nonr-28546)
Unclassified report

DESCRIPTORS: (*Algebraic topology, Groups (Mathematics), *Functional analysis, Transformations (Mathematics), Sequences, Scheduling, *Spheres.)

All manifolds, with or without boundary, are to be compact, oriented, and differentiable of class 0 to infinity. The boundary of M will be denoted by bM. The manifold M with orientation reversed is denoted by -M. (Author)

AD-273 571 Div. 15, 30
(TISTP/JW) OTS price $5.60

Naval Research Lab., Washington, D. C.
SOME ASPECTS OF GO/NO-GO TESTING OF RANDOMNESS OF CONTINUALLY GENERATED BINARY DIGITS.
Interim rept.,
by H. M. Suski. 1 Mar 62, 52p. incl. illus. tables, refs. (NRL rept. no. 5730)
Unclassified report

DESCRIPTORS: (Probability, Measurement, Sampling.) (Mathematical analysis, *Mathematical logic, Equations.) (*Measure theory, Tables.) (Digital computers, Coding, Statistical distributions, Statistical processes.)

Problems associated with measuring randomness in the dynamic case of a generator continually producing binary digits are investigated. The mathematics of Bernoulli trials serves as the model against which the performance of the generator is compared. It is shown that there are a large number of ways in which a measuring system might be attempted. Such systems are based on explicit functions (called measure functions) of p; the probability that a one is generated.

AD-273 491 Div. 16
(TISTB/LH) OTS price $.75

Behavioral Sciences Lab., Aerospace Medical Div., Wright-Patterson Air Force Base, Ohio.
REMOTE HANDLING OF MASS.
Rept. for Mar-Aug 61 on Human Performance in Advanced Systems,
by Billy M. Crawford and William N. Kama. Dec 61, 25p. incl. illus. tables, 13 refs.
(Proj. 7184)
(ASD TR 61-627) Unclassified report

DESCRIPTORS: *Remote control systems, *Weightlessness, Simulation, Human engineering, Handling, Sensitivity, Control, Effectiveness.

Man's ability to make differential and absolute judgments of remotely handled masses was investigated under simulated weightlessness conditions. An analysis of the results revealed: (a) remote handling under weightlessness conditions produces increments in just-noticeable differences which are roughly proportional to the mass of the remote manipulator components involved in handling the stimulus objects; (b) differential sensitivity for mass can be improved by increasing the accelerative force imposed upon the stimulus objects; (c) absolute judgments tend to be less under weightlessness conditions for either direct or remote handling; and (d) remote handling tends to produce greater and more variable estimates of both weight and mass. (Author)

16. MEDICAL SCIENCES

AD-273 485 Div. 16
(TISTB/CCH) OTS price $.50

Army Chemical Research and Development Labs., Army Chemical Center, Md.
A STUDY OF THE EFFECTS OF CONTINUOUS INHALATION OF HIGH CONCENTRATIONS OF OXYGEN AT AMBIENT PRESSURE AND TEMPERATURE.
Rept. for Jan-Aug 60 on Health Hazards of Materials and Radiation,
by Francis W. Weir, Dale W. Bath and others.
Dec 61, 12p. incl. illus. table, 12 refs.
(Proj. 71650)
(ASD TR 61-664) Unclassified report

DESCRIPTORS: (*Oxygen consumption, Dosage, Temperature, Pressure, Survival, Laboratory animals.) (*Oxygen, *Toxicity, Pathology, Respiratory system.)

Investigations were carried out to determine the times of occurrence and progression of toxic effects in rats, and the times to death for various animal species exposed continuously to relatively pure oxygen at controlled environmental conditions and ambient pressures and temperatures. Mice, rats, guinea pigs, dogs, and monkeys were exposed continuously to oxygen (95-99%) for 240 hours, unless interrupted by death. The initial toxic effects of exposure were labored breathing and lethargy which occurred after 15 to 20 hours in the rodents and 36 to 42 hours in the dogs. In the monkeys, these effects occurred considerably later, 72 to 96 hours. Most animals dying during exposure showed extensive bilateral pleural effusions and pulmonary edema. Animals surviving 240 hours of oxygen exposure showed severe organ and tissue damage, including pulmonary edema, but did not show pleural effusion. (Author)

AD-273 511 Div. 16
(TISTB/CCH) OTS price $4.60

Lockheed Aircraft Corp., Marietta, Ga.
HUMAN PERFORMANCE AS A FUNCTION OF THE WORK-REST RATIO DURING PROLONGED CONFINEMENT.
Rept. on Training, Personnel and Psychological Stress Aspects of Bioastronautics,
by Oscar S. Adams and W. Dean Chiles. Nov 61, 44p. incl. illus. tables, 5 refs.
(Contracts AF 33(616)6050 and AF 33(616)7607, Proj. 1710)
(ASD TR 61-720) Unclassified report

DESCRIPTORS: (*Closed cycle ecological systems, Man, Confinement.) (*Behavior, Stress (Physiology), Stress (Psychology).) (Feasibility studies, Simulation.)

The feasibility of using a 4-hours-on and 2-hours-off-duty schedule in the operation of advanced aerospace systems was investigated. Two B-52 combat-ready crews were confined for 15 days in a simulated advanced system crew compartment and were tested with a battery of five performance tasks and four psychophysiological measures. Data obtained during two 15-day testing periods are summarized. Additional performance data obtained from five studies using college student subjects are presented. These results are based on four 96-hour investigations (two with a 4-on and 2-off schedule and two with a 6-on and 2-off schedule) and one 120-hour control group study (4 hours per day, 5 days per week, for 6 weeks). With proper control of selection and motivational factors, crews can work effectively for periods of at least two weeks and possibly longer using a 4-on and 2-off work-rest schedule. (Author)

Division 16 - MEDICAL SCIENCES

AD-273 513 Div. 16
(TISTB/CCH) OTS price $4.60

Ohio State U. Research Foundation, Columbus.
THE CORONARY HEMODYNAMIC RESPONSE TO ENVIRONMENT.
Rept. on Physiology Research,
by Leo A. Sapirstein and Eric Ogden. Nov 61,
34p. incl. tables, 16 refs.
(Contract AF 33(616)6928, Proj. 7163)
(ASD TR 61-616) Unclassified report

DESCRIPTORS: (*Pressure breathing, *Oxygen consumption, Blood circulation, Blood pressure.) (Heart, Arteries.) (Pressure suits, Resistance.) (Blood volume, Measurement, Instrumentation.)

Positive pressure breathing with 100 percent oxygen in dogs wearing bladder-type partial pressure suits causes major reduction in the cardiac output despite equal counter pressure to the respiratory passageway and the absence of pulmonary hyperinflation. These experiments were carried out to investigate the possibility that the circulatory defect was a consequence of defective myocardial perfusion. The experimental work revealed that coronary blood flow was significantly reduced in dogs wearing the pressure suit. The reduction in coronary flow was insignificantly less than the reduction in cardiac output and the coronary resistance was increased. This is in contrast with what is observed when the primary circulatory defect is one of the failure of venous return. This suggests that major circulatory difficulty encountered in the pressure suit used may be a consequence of coronary vasoconstriction as a primary event. The circulatory failure which occurs in the pressure suit may be of cardiac rather than peripheral origin. (Author)

AD-273 602 Div. 16
(TISTB/AW) OTS price $2.60

Aerospace Medical Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
MOTION SICKNESS AND SPATIAL PERCEPTION. A THEORETICAL STUDY.
Rept. on Complex Response of the Individual to Acoustic Energy,
by Jack E. Steele. Nov 61, 23p. incl. illus. 63 refs.
(Proj. nos. 7210 and 7232)
(ASD TR 61-530) Unclassified report

DESCRIPTORS: (*Motion sickness, Stimulation, Motion, Rotation, Acceleration.) (Sensory perception, *Space perception, Eye, Ear.)

Theories of motion sickness are reviewed and compared with a new theory in which the activity of the central nervous system is more important than the intensity or modality of sensory stimulation. Concepts treated are the development and validation of an inertial reference frame; the perceptual transformation of sensory data, which reduces its content, increases its reliability and can incorporate compensations for environmental variables; and the consequences of perceptual inadequacy. (Author)

AD-273 667 Div. 16
(TISTB/CCH) OTS price $1.60

Aerospace Medical Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
THE ELECTROCARDIOGRAM AND VECTORCARDIOGRAM OF NORMAL MACACA MULATTA IN DORSAL-SUPINE, RIGHT-LATERAL, LEFT-LATERAL, AND SITTING POSITIONS.
Rept. May-July 61 on Biomechanics of Aerospace Operations,
by F. R. Robinson and R. L. Hamlin. Dec 61,
13p. incl. illus. tables, 13 refs.
(Proj. 7231)
(ASD TR 61-738) Unclassified report

DESCRIPTORS: (*Electrocardiography, Primates, Measurement.)

Electrocardiograms and vectorcardiograms of 11 normal monkeys placed in dorsal-supine, right-lateral, left-lateral, and sitting positions were analyzed and results presented. This information is of immediate importance in determining electrocardiographic and vectorcardiographic changes that may be induced in monkeys by lateral impact. Leads taken were I, II, III, aVR, aVL, aVF, MV1, MV2, and MV3. Parameters analyzed from the electrocardiogram lead II included: rhythm, rate, PR interval, P wave duration, PQ segment duration, and QRS duration. The mean P vector projection in the frontal plane was also calculated. Amplitudes of the component deflections in leads I, aVF, and MV1 were determined. Vectorcardiograms were analyzed for: direction of inscription, ratio of length to width, and the mean axis of the QRS vector projected on the three planes for each body posture. This report will serve as a base line for analysis for electrocardiographic or vectorcardiographic data analyzed in experiments on monkeys placed in any of the four positions. (Author)

AD-273 863 Div. 16
(TISTB/LH) OTS price $1.60

Naval Missile and Astronautics Center, Point Mugu, Calif.
EXPOSURE OF HUMAN SUBJECTS TO 100% OXYGEN AT SIMULATED 34,000-FOOT ALTITUDE FOR FIVE DAYS,
by A. L. Hall and H. B. Kelly, Jr. 6 Apr 62,
13p. incl. illus. tables, 13 refs. (Technical memo. no. NMC-TM-62-7)
Unclassified report

DESCRIPTORS: (*Medical research, *Oxygen consumption, *Aviation personnel.) (Altitude chambers, Low pressure research, Naval personnel, Diet, Metabolism, Sleep, Blood, Metabolic products, Simulation.)

Two volunteer Navy enlisted men were subjected to an atmosphere of 100% oxygen at a pressure altitude of 34,000 feet in a low-pressure chamber for a period of 120 hours. One subject wore a full pressure suit and was fed a low-bulk diet to reduce fecal formation. The other subject wore a flight suit and was fed normal Navy food. The subjects tolerated all aspects of the exposure without physiological deterioration. Some physical difficulties included inflammation of the sclera in both subjects and symptoms of immersion foot in the subject wearing the full pressure suit. These, however, were considered minor and could be prevented in subsequent experiments. (Author)

17. METALLURGY

AD-273 563 Div. 17, 25
(TISTM/BRW) OTS price $3.50

National Aeronautics and Space Administration, Washington, D. C.
CERTAIN PROBLEMS RELATED TO THE VISCOSITY OF FUSED METALS,
by Ye. G. Shvidkovskiy. Mar 62, 201p. incl. illus. tables (Technical translation F-88 of Nekotoryye voprosy vyazkosti rasplavlennykh metallov (Moscow) 1955)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical Translation F-88.

DESCRIPTORS: (*Alloys, *Metals, Phase studies, Liquids, *Viscosity, Measurement, Theory, Crystallization, Impurities.) (Data, Steel, Cast iron, Iron alloys, Chromium alloys, Carbon alloys, Lead, Tin, Bismuth, Aluminum, Tin alloys, Lead alloys, Bismuth alloys, Zinc, Cadmium.) USSR.

The monograph examines the theory of the torsional oscillation method for measuring the viscosity of liquids, and experimental technical problems associated with the use of this method, presents the results obtained during the measurement of the viscosity of fused metals and alloys, and gives a theoretical interpretation of certain problems concerned with the nature of the liquid state (structure of the liquid, mechanism of the viscous flow, kinetics of crystallization, the effect of insoluble impurities on the viscosity, etc.). The monograph includes original studies conducted by the author and his associates. The book is of interest to scientific workers, such as physicists and engineers, engaged in a study of the problem of the liquid state, and also to aspirants (post-graduate students) and senior students, specializing in the field of molecular physics and physics of metals. (Author)

AD-273 621 Div. 17
(TISTM/TCG) OTS price $6.60

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
PREPARATION AND EVALUATION OF HIGH PURITY BERYLLIUM.
Final rept., 2 Nov 60-1 Nov 61,
by Grant E. Spangler, Marvin W. Herman, and Edward J. Arndt. 1 Nov 61, 59p. incl. illus. 23 refs. (Rept. no. F-A2476)
(Contract NOw 61-0221-d)
Unclassified report

DESCRIPTORS: (*Beryllium, Preparation, Purification by Zone melting, Crystallization, Single crystals, Metallic crystals and Vaporization of Impurities.) (Crystals, Tensile properties, Deformation, Mechanical properties, Hardening, Shear stresses, Fracture (Mechanics).) Electron microscopy, Spark machining.

Zone refining procedures for vertical floating-zone type zone melting of Be are described. Single crystals prepared from zone melted Be were tested in tension with their orientation arranged to yield basal plane slip. The critical resolved shear stress varied from 2400 to 400 psi, decreasing with increased purification; the glide strain varied from 16 to 220% increasing with increased purification. Procedures for the rolling of several single crystals of Be are described and the results of recrystallization studies on them are presented. Limited slip, observed when basal flow occurs in polycrystalline material, appears to result from grains constraining one another during deformation. This mechanism of fracture is expected to operate independently of the level of purity of Be. (Author)

AD-273 672 Div. 17, 25
(TISTM/GEC) OTS price $10.10

Auburn Research Foundation, Alabama Polytechnic Inst.
INVESTIGATION OF MECHANISM OF FAILURE OF HIGH-STRENGTH MATERIALS. PART I. THE EFFECT OF SPECIMEN GEOMETRY ON FRACTURE TOUGHNESS OF HIGH-STRENGTH SHEET STEEL. PART II. THE EFFECT OF TEMPERING TEMPERATURE, GRAIN SIZE AND TEST TEMPERATURE ON FRACTURE TOUGHNESS OF HIGH-STRENGTH SHEET STEEL,
by Hal W. Maynor, Jr., Richard E. Mueller, and Edward O. Jones, Jr. 12 Jan 62, 1v. incl. illus. tables, refs. (Rept. no. 1)
(Contract DAI 01-009-ORD-889)
Unclassified report

DESCRIPTORS: (Metals, *Steel, Sheets, *Failure (Mechanics), *Fracture (Mechanics), Grains (Metallurgy), Thickness, Heat treatment, Temperature.) (Mechanical properties, Tensile properties.)

As a result of the brittle fracture of a number of solid propellant rocket motor cases at stresses well below the design yield strengths of the sheet steels used (200,000 psi or better), an investigation was begun. The investigation included: The effect of specimen geometry on fracture toughness; and the effect of tempering temperature, grain size, and test temperature on fracture toughness. Such factors effecting fracture toughness as width, crack length-to-width ratios, width-to-thickness ratios, constant crack lengths, ferrite grain sizes, and the effect of different tempering temperatures on all of the foregoing factors, were discussed.

AD-273 689 Div. 17, 25
(TISTM/BRW) OTS price $3.60

Belfour Engineering Co., Suttons Bay, Mich.
FATIGUE OF METALS. LOW ALLOY STEEL. SECTION I. EFFECT OF ULTIMATE TENSILE STRENGTH ON THE FATIGUE BEHAVIOR OF 4340 STEEL.
Rept. on Mechanical Properties Information Processing System. Feb 62, 26p. incl. illus. tables, 11 refs.
(Contract AF 33(616)7238, Proj. 7381)
(ASD TN 61-117, pt. 3) Unclassified report

DESCRIPTORS: (*Fatigue (Mechanics), Steel (4340), Tensile properties, Tests, Data.) Metals, Alloys.

The graphs presented display metals fatigue information from various sources of published and unpublished test reports which have been processed and regenerated through a semi-automatic data processing system. Each series or set of graphs contain descriptive information (legends) which identifies the material, test procedure, test conditions and the most significant test and/or material variables associated with the plotted data. The data displayed in each set of graphs is intended to answer general questions and to serve as a guide to further investigations of specific areas within the subject presented. (Author)

AD-273 703 Div. 17, 2
(TISTB/LH) OTS price $3.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
TERNARY MINERALS AND COMPOUNDS: AN ANNOTATED BIBLIOGRAPHY,
comp. by A. A. Beltran. Feb 62, 35p. refs.
(Special bibliography no. SB-62-4; Rept. no. 2-98-62-3)
(Contract AF 33(616)8490)
Unclassified report

DESCRIPTORS: (*Bibliography, *Minerals, *Metals.) (Cobalt, Copper, Lead, Iron, Manganese, Mercury, Nickel, Silver, Zinc, Antimony, Arsenic, Bismuth, Selenium, Sulfur, Tellurium.)

AD-273 705 Div. 17
(TISTM/GEC) OTS price $5.60

Massachusetts Inst. of Tech., Cambridge.
METALLURGICAL ASPECTS OF FRACTURE AT HIGH STRENGTH LEVEL,
Interim technical rept.,
by Walter A. Backofen and Merrill L. Ebner.
Mar 62, 52p. incl. illus. tables, refs.
(Contract DA 19-020-ORD-5235, Proj. 5B93-32-004)
(WAL TR 310.24/5-2)
Unclassified report

DESCRIPTORS: (Alloys, Sheets, *Nickel alloys (AISI 4340), Chromium alloys, Manganese alloys, Cobalt alloys, Manufacturing methods, Processing, Heat treatment, Austenite.) (Tests, Mechanical properties, Tensile properties, Hardness, Impact shock, *Fracture (Mechanics), Deformation, Grains (Metallurgy), Microstructure, *Metallurgical analysis.)

The fracture toughness, Kc, of quenched and tempered sheet specimens of air-melted and cross-rolled AISI 4340 was measured by procedures basically in accordance with those recommended by the special ASTM Committee on Fracture Testing. Kc was obtained from the elastic analysis of G. R. Irwin (ASM Symposium, Fracturing of Metals, 1948, p. 152) with and without the plastic-zone correction, and by the elastic-plastic analysis of F. A. McClintock (ASTM Bulletin, Apr. 1961, p. 277). The two values calculated from the Irwin analysis were essentially the same for specimens tempered below 400 F, but without correction values were 15% lower for specimens tempered at 700 F. Kc values calculated according to McClintock agree within 20% with the corrected Irwin values for specimens tempered between 500 and 800 F. Comparison of the Kc values with those of R. Rawe (Aerojet-General Corp., Rept. M2003, Feb. 1960) indicate that Kc for AISI 4340 was very sensitive to processing history. Extensive splitting, or delamination, along the plane of the sheet was observed in all fractures. This delamination might contribute to low plane-strain fracture toughness and high toughness-transition temperature. (Author)

AD-273 707 Div. 17
(TISTM/GEC) OTS price $5.60

Martin Marietta Corp., Baltimore, Md.
STRUCTURAL RESPONSE OF BERYLLIUM SHEET PRODUCED BY THREE FABRICATION METHODS.
Final rept., Feb 60-Mar 61,
by C. J. Giemza. Dec 61, 47p. incl. illus. tables, 7 refs.
(Contract AF 33(600)40648, Proj. 1368)
(ASD TR 61-87) Unclassified report

DESCRIPTORS: (Metals, *Sheets, *Beryllium, Manufacturing methods, Processing.) (Tests, *Mechanical properties, *Tensile properties, Elasticity, Deformation, Stresses.) (Alloys, Stainless steel (PH15-7Mo,RH950), Titanium alloys (Ti6Al-4V).)

Hot-pressed, hot-upset and hot cross-rolled Be sheets were examined to assess their differences and advantages from a structural design viewpoint. Tension, notch tension, compression, bend ductility and box-beam tests, with the main emphasis on factors which tend to embrittle Be, were conducted. The results showed that hot cross-rolled Be sheet exhibited both high strength and high elongation in tensile tests but was relatively brittle when, as in bending, the stress was complex. Hot-pressed Be sheet, which was low in tensile strength and elongation, demonstrated an excellent capacity for accommodating complex stresses in bending without fracture. The hot-upset Be sheet exhibited the best characteristics possessed by both hot-pressed and hot cross-rolled Be, though to a lesser degree than the optimum of each. The differences in mechanical behavior among the 3 groups were apparently a function of the degree of preferred orientation. However, the amounts of impurity elements which were reported could have contributed significantly to the embrittlement of the hot-pressed and hot cross-rolled Be sheet. (Author)

AD-273 711 Div. 17, 26, 27, 25
(TISTM/BRW) OTS price $3.60

Naval Weapons Lab., Dahlgren, Va.
Gc TESTS OF WELDS IN Ti-13V-11Cr-3Al ALLOY SHEETS FROM COMPANY A AND Gc TESTS OF AGE-STRENGTHENED BASE METAL AND OF WELDS IN Ti-6Al-4V AND Ti-13V-11Cr-3Al ALLOY SHEETS FROM COMPANY F - SUMMARY REVIEW OF FRACTURE TOUGHNESS RESULTS ON TITANIUM ALLOYS BEING CONSIDERED FOR SOLID-PROPELLANT ROCKET MOTOR CASES,
by H. E. Romine. 30 Mar 62, 43p. incl. illus. tables, refs. (NWL rept. no. 1798)
Unclassified report

DESCRIPTORS: (*Rocket cases, Materials, *Sheets, *Titanium alloys-base, Aluminum alloys, Chromium alloys, Vanadium alloys, *Welds, *Fracture (Mechanics), Heat treatment, Crystal structure, Microstructure, Aging, Hardness, Data.)

Several conditions of welds in all-beta Ti-13V-11Cr-3Al alloy were examined for fracture toughness properties. Similar tests were run on age-strengthened base metal and on annealed welds in samples from another source representing Ti-6Al-4V and Ti-13V-11Cr-3Al alloys. The results were included in a summary review of fracture toughness in base metal and in welds of both alloys. At a yield strength to density ratio of approximately one million in., there appeared to be no serious fracture toughness problems with Ti-6Al-4V alloy. Under similar conditions, the all-beta base metal (Ti-13V-11Cr-3Al) had somewhat less than optimum fracture toughness so that a construction practice practically eliminating flaws in finished cases would be required. In the all-beta welds, some practices appeared to give satisfactory toughness. (Author)

AD-273 713 Div. 17
(TISTM/GEC) OTS price $8.60

North American Aviation, Inc., Columbus, Ohio.
DOD HIGH STRENGTH TITANIUM ALLOY SHEET RESEARCH PROGRAM.
Progress rept. no. 16, 1 Nov 61-31 Jan 62,
by D. E. Myers. 31 Jan 62, 86p. incl. illus. tables, refs. (Rept. no. NA57H-527-16)
(Contract NOa(s) 57-785d)
Unclassified report

DESCRIPTORS: (*Alloys, *Titanium alloys, Aluminum alloys, Zirconium alloys, Tin alloys, Sheets.) (Tests, Chemical analysis, Metallurgical analysis, High temperature research, Mechanical properties, Creep, Deformation, Surface properties, Tensile properties, Electric welding, Resistance.) Tables.

This report contains data for the 5-5-5 and 7-12 sheet alloys, including evaluations to be conducted and data obtained to date. The surface finish and flatness of the sheets were superior to the heat-treatable alloys and the sheets tested exceeded target mechanical properties with the exception of the bend radii of one 7-12 sheet. To establish machinability criteria the Box Wilson Statistical Method will be employed. Cleaning requirements for fusion welding are similar to the 5-2 1/2 alloy and preliminary resistance weld tests produced a higher Tension/Shear ratio for the 5-5-5 than the 7-12. (Author)

AD-273 751 Div. 17, 26
(TISTM/BRW) OTS price $2.60

Wah Chang Corp., Albany, Oreg.
REDUCTION AND CONSOLIDATION OF SUPERIOR QUALITY MOLYBDENUM ALLOYS.
Interim rept., 1 Nov 61-15 Feb 62,
by Socrates S. Christopher and James Wong.
15 Feb 62, 21p. incl. illus. tables (Rept. no. WCA 1001-8)
(Contract NOa(s) 60-6046-c)
Unclassified report

DESCRIPTORS: (Production, Sheets, *Molybdenum alloys, Melting by Electron beams, Electric arcs, Extrusion, Rolling mills.) Powder alloys, Processing, Crystallization, Temperature, Reduction by Hydrogen and Calcium, Mechanical properties, Alloys.

Two arc melted and one electron-beam melted extrusion billets of calcium reduced Mo were extruded to sheet bars. These extrusions were processed into sheet and evaluated. The electron-beam melted Mo had a recrystallization temperature of 1500 F for one hour compared to 2600 F for the arc melted material. Mechanical properties of the two materials tested were comparable to commercial arc melted molybdenum. Heat treatment studies on hydrogen reduced electron-beam melted Mo showed the material to be brittle after complete recrystallization. (Author)

AD-273 767 Div. 17, 31
(TISTM/EJH) OTS price $5.60

National Research Council, Washington, D. C.
MILL SAMPLING TECHNIQUES FOR QUALITY DETERMINATION OF SHIP STEEL PLATE.
Final rept. on Proj. SR-139,
by Charles L. Staugaitis. 28 Feb 62, 47p. incl. illus. tables, 14 refs. (Serial no. SSC-141)
(Contract NObs-84321)
Unclassified report

DESCRIPTORS: (*Steel, *Ship plates, *Metal plates, Sheets, Mechanical properties, Tensile properties, Manufacturing methods, Rolling mills, Heat treatment, Failure (Mechanics), Fracture (Mechanics), Test methods, Impact shock, Microstructure.)

To evaluate the variation in notch toughness of currently produced ship plate steel, studies were made of 105 plates submitted by 5 producers. The plates were selected to give statistical information regarding the variation in composition, mechanical properties and microstructure that might be expected within heats and ingots, and with position in the plate. The notch toughness was evaluated primarily by the Charpy V-notch impact test, although 2 cooperating laboratories tested many of the plates with the drop weight and van der Veen slow bend tests. The results showed somewhat different patterns for the fully killed and semikilled grades, and sampling plans for each grade are suggested. Because of the uniformity of the mill practices, it was not possible to assess the separate effects of processing variables on notch toughness. (Author)

AD-273 800 Div. 17, 14
(TISTM/GEC) OTS price $21.00

Chance Vought Corp., Dallas, Tex.
MECHANICAL PROPERTIES OF SOME ENGINEERING MATERIALS. UNPUBLISHED DATA FROM COMPANY SPONSORED PROGRAMS.
Quarterly rept. no. 4, vol. 1 on Phase 1,
1 Dec 61-28 Feb 62,
by J. J. Peterson. 15 Mar 62, 380p. incl. illus. tables (CVA rept. no. 2-53420/2R373)
(Contract AF 33(616)7986)
Unclassified report

DESCRIPTORS: (Materials, *Mechanical properties, *Tensile properties, Physical properties, Test methods.) (*Adhesives, Resin adhesives, Rubber adhesives, *Laminates, Resins, Plastics, Glass textiles, *Seals, *Sealing compounds.) (*Alloys, *Steel (4130, 15-7PH, 4340, 300M), *Stainless steel (AM 350, A286, AM 355, 321, 422, PH 15-7 Mo, 17-4 PH), *Aluminum alloys (7075-T73, X2219-T6), Vanadium alloys.) (Honeycomb cores, Sandwich construction, Brazing, Silver solders (AMS 4770).) (*Nickel alloys (Inconel-X, Rene' 41, M-252, Inconel 718), Chromium alloys, Cobalt alloys, Molybdenum alloys, *Titanium alloys.)

The information contained in this report consists primarily of previously unpublished mechanical property data on some engineering materials. Although mechanical property data is of primary concern, there is some information presented on physical properties. Materials covered are adhesives, Al, braze alloys, fiberglas, Inconel, laminates, Mo, pneumatic seals, Rene' 41, sealants, steel, super alloys and Ti. (Author)

AD-273 855 Div. 17, 26, 27, 4
(TISTM/BRW) OTS price $1.60

Aerospace Corp., Los Angeles, Calif.
MATERIALS AND STRUCTURES. ELECTROPLATING OF TUNGSTEN FROM NONAQUEOUS LEWIS ACID SOLUTIONS.
Semiannual technical rept. 1 July-31 Dec 61,
by F. D. Hess and L. Schieler. 28 Feb 6
13p. incl. table (Rept. no. TDR-930(2240-10)TR-1)
(Contract AF 04(647)930)
(DCAS TDR 62-18)
Unclassified report

DESCRIPTORS: (*Electroplating, *Tungsten, Organic compounds, Electrolytes, Acids, Solutions.)

Division 18 - MILITARY SCIENCES AND OPERATIONS
Division 19 - NAVIGATION
Division 20 - NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

An experimental investigation of the electroplating of tungsten from organic electrolytic solutions is described. The method depends on solution of a tungsten halide in a Lewis acid solvent which will leave the tungsten in the cationic state. Preliminary tests with tungsten hexachloride dissolved in a boron trifluoride etherate did not yield a metallic tungsten plate. (Author)

AD-273 867 Div. 17, 26
(TISTM/BRW) OTS price $10.50

Electric Boat Div., General Dynamics Corp., Groton, Conn.
INVESTIGATION OF WELDABILITY OF HOT-WORK TOOL STEELS.
Rept. for 3 Apr 59-31 Mar 61 on Materials Application,
by N. A. Sinclair, J. G. Maciora and R. P. Sopher.
Dec 61, 125p. incl. illus. tables, 13 refs.
(Contract AF 33(616)6519, Proj. 7381)
(ASD TR 61-165) Unclassified report

DESCRIPTORS: (*Tool steel, Sheets, Metal plates, Arc welding, *Welding, Heat treatment, Hardening, Thermal stresses, Fracture (Mechanics), Tensile properties, Stresses, Pressure vessels.) Tests, Welds, Microstructure, Impact shock, Aircraft, Guided missiles, Rocket cases.

The weldability of 6 hot-work tool steels was investigated to develop optimum welding procedures. Welds were made in sheet and plate with the inert-gas tungsten-arc and inert-gas consumable electrode processes under various welding conditions. Variations in preheat, postheat, and energy input had statistically significant, but practically unimportant, effects on mechanical properties after hardening and tempering. Most mechanical-test failures were initiated in the welds whether or not defects were present. The weld metal retained its heterogeneous microstructure after hardening and tempering even when previously subjected to annealing-type heat treatments. Lehigh-restraint-test studies indicated that hot and cold cracking can occur. Low-temperature cracking can be prevented by increasing the preheat temperature. Large-radius Charpy-impact specimens were found to be more satisfactory than the V-notched specimens for these steels. The high-temperature weld tensile strength at 1000 F was 190,000 psi for an H-11 steel; it was reduced to 156,000 after holding at 1000 F for 24 hours. (Author)

18. MILITARY SCIENCES AND OPERATIONS

No Entries

19. NAVIGATION

AD-273 538 Div. 19
(TISTW/DLW) OTS price $11.00

Bell Aerosystems Co., Buffalo, N. Y.
AIRCRAFT LANDING SYSTEM COMPATIBILITY STUDY. C-121C. AN/GSN-5.
Final engineering rept.
Feb 62, 136p. incl. illus. tables (Rept. no. 60003-046)
(Contract AF 33(616)6483)
Unclassified report

DESCRIPTORS: (*Ground-controlled approach radar, *Airport radar systems, Automatic pilots, *Transport planes, *Radar navigation, Automatic, Reliability, Flight testing.) (Radar signals, Data processing systems, Data transmission systems, *Radio navigation, Tests.) (*All-weather aviation, Landing, Instrument landing, Radar equipment, Radio equipment.)

The Landing Control, Central, AN/GSN-5 is a ground-based, final approach navigation system providing three basic approach and landing techniques, namely, completely automatic control, cross-pointer guided approach, and talkdown. These techniques may be used singularly or in combination. In all cases, however, aircraft surveillance and guidance information are maintained to touchdown. A study was made of the compatibility of the C-121C aircraft, the PB-10A autopilot, and the landing control, central, AN/GSN-5 which indicated that the aircraft and the AN/GSN-5 system are compatible for cross-pointer or talkdown guided approaches. While aircraft control in the longitudinal plane is adequate for all-weather automatic final approaches, the lateral control of the C-121C is such that the aircraft and the AN/GSN-5 system are only quasi-compatible. (Author)

20. NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

AD-273 452 Div. 20, 8
(TISTE/CDM) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
A QUALITATIVE STUDY OF RADIO-FREQUENCY INTERFERENCE IN RADIAC-TELEMETRY SYSTEMS,
by H. A. Zagorites and D. Y. Lee. 8 Feb 62, 17p. incl. illus. table, 7 refs. (Research and development technical rept. no. NRDL-TR-544)
Unclassified report

DESCRIPTORS: (Radiofrequency, *Interference in *Radiation counters, Recording devices from *Telemetering transmitters, Tests, Measurement.) (Telemeter systems, *Radio equipment, Telemetering data, Radiological contamination, Errors, Reliability.)

A qualitative evaluation was made of the effects of radio frequency interference (RFI) and bandwidth limitation on the accuracy and reliability of transmitted data from a typical nuclear radiation instrument coupled to a standard telemetry system. Significant errors resulted from RFI. These errors demonstrated the need for RF isolation in high impedance elements of nuclear radiation instruments coupled to telemetry equipment or operating in RF environments. Bandwidth limitation did not significantly affect the accuracy or reliability of the pulsed output system used; however, noise reduced data reliability at very low pulse repetition rates. (Author)

AD-273 456 Div. 20
(TISTP/MFA) OTS price $3.60

Nuclear Defense Lab., Army Chemical Center, Md.
THERMAL AND FAST NEUTRON EFFECTS ON DOSIMETER FILMS,
by Robert J. Smith. Oct 61, 33p. incl. illus. tables, 8 refs. (Rept. no. NDL-TR-13)
Unclassified report

DESCRIPTORS: (*Thermal neutrons, *Fast neutrons, *Dosimeters, Radioactive films, Photographic emulsions, Detectors.) (*Water boiler reactors, Gamma rays, Gamma emission, Sensitivity, Photons.) (Cadmium, Lithium, Gold, Fuels.) Experimental data.

To accurately measure the initial gamma radiation from atomic detonations, the effect of neutrons on gamma detectors was evaluated. Eight film types, encased in NBS holders and covering a range of 0.3 to 50,000 r, were exposed to thermal-and-fast-neutron radiation. The lithium extrapolation method was used in the evaluation. Two points seem evident concerning the fast-neutron sensitivity of film: (1) the sensitivity of the film increases with increasing neutron energy from 1 to 14 Mev and (2) the ratio of the sensitivity of the film is roughly equal to the reciprocal of the ratio of their grain sizes.

AD-273 499 Div. 20
(TISTP/TL) OTS price $13.50

Illinois U., Urbana.
PHOTOPRODUCTION OF POSITIVE PIONS FROM HYDROGEN NEAR THRESHOLD. PART II. POSITRON DECAY COUNTING METHOD,
by Richard A. Carrigan and Edwin L. Goldwasser. Feb 62, 189p. incl. illus. 92 refs. (Technical rept. no. 32)
(Contract Nonr-183405)
Unclassified report

DESCRIPTORS: (*Photonuclear reaction, *Production of *Positive pions from *Hydrogen, Nuclear physics.) (Matrix algebra, Scattering, Bremsstrahlung, Spectrographic analysis, Mesons.) (*Positrons, Radioactive decay, Counting methods, *Photomultipliers.)

A discussion of the physical basis underlying some of the generally accepted terms in the photoproduction cross section is presented. Then the evaluation of the renormalized pion-nucleon coupling constant using the functional form of the cross section is explained. Finally brief mention is made of recent attempts to generalize the dispersion relation method. (Author)

AD-273 539 Div. 20, 4, 14, 8, 17
(TISTB/LH) OTS price $3.60

Radiation Effects Information Center, Columbus, Ohio.
MONTHLY ACCESSION LIST 55.
Rept. for 1 Jan-28 Feb 62.
15 Mar 62, 33p. (REIC Accession list no. 55)
(Contract AF 33(616)7375, Proj. 1448)
Unclassified report

DESCRIPTORS: (*Bibliography, *Radiation effects, Radiation damage, Electronics, Polymers, Metals, Organic compounds, Inorganic substances, Dosimeters.)

AD-273 540 Div. 20
(TISTP/TL) OTS price $7.60

Bendix Systems Div., Bendix Corp., Ann Arbor, Mich.
LABORATORY PROCEDURES ION AUGMENTATION EXPERIMENTS,
by A. O. Kresse and P. J. Doody. 9 Feb 62, 75p. incl. illus. table, 7 refs. (Rept. no. FS-62TN-1025; BSC-29556)
(Contract AF 04(694)26)
Unclassified report

DESCRIPTORS: (*Ions, *Thrust augmentor nozzles, Tests, *Electrons.) (Rocket motor, Pressure, Temperature, Measurement.) (*Spectrographic analysis, Optics, Detections, Blackbody radiation.) (*Gas flow, *Plasma physics.) (Numerical analysis, Integral equations.)

The conduct of the experimental analysis of electron seeding techniques is described. The purpose of this presentation is to clarify the experimental techniques used and to detail the mathematical procedures necessary for analysis and interpretation of the data. The basic purpose of the experiments is twofold: first, quantitative empirical definition of the performance of electron augmenters, both ablative and rocket motor types, when subjected to a range of conditions which will affect their performance; second, an estimate of the important processes and their rates which determine the rate of electron disappearance in flow subsequent to their generation. (Author)

AD-273 541 Div. 20
(TISTM/GEC) OTS price $1.60

Florida U., Gainesville.
THE NUCLEAR PROPERTIES OF RHENIUM.
Quarterly progress rept. no. 9, 8 Dec 61-8 Mar 62,
by R. A. Karam, T. F. Parkinson and F. J. Munno.
8 Mar 62, 9p. incl. illus. table, 6 refs.
(Contract NOa(s) 60-6012-c)
Unclassified report

DESCRIPTORS: (*Rhenium, Nuclear reactions, Isotopes, Radiochemistry, Gamma-neutron reactions, *Neutron cross sections, Nuclear physics.)

The nuclear reactions Re-185 (n,p) W-185, Re-187 (n,p) W-187, Re-185 (n,alpha) Ta-182, Re-187 (n,alpha) Ta-184, Re-185 (n,2n) Re-184 and Re-187 (n,2n) Re-186 with 14 Mev neutrons are discussed theoretically. It appears that the (n,alpha) reactions are not possible. The (n,p) reactions are possible but not very probable. The (n,2n) reactions have the largest cross sections of any of these reactions. The Re-187 (n,2n) Re-186 reactions cross section was calculated to be 2.3 barns compared to a preliminary experimental value of 2.49 ± 50% barns. (Author)

Division 20 - NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

AD-273 627 Div. 20, 25
(TISTP/WH) OTS price $2.60

Max-Planck-Institut fuer Aeronomie (Germany).
RESULTS OF BALLOON FLIGHTS FOR COSMIC RADIATION MEASUREMENTS AT WEISSENAU AND LINDAU (GERMANY),
by H. Erbe. 31 Dec 61, 14p. illus. tables, 11 refs. (Technical note no. 3; Trans. of Mitteilungen aus dem Max-Planck-Institut, no. 6, 1961)
(Contract AF 61(052)372)
(AFOSR-2393) Unclassified report

DESCRIPTORS: (Intensity of *Cosmic rays in Atmosphere over Germany.) (*Cosmic ray telescopes, Radiation counters, Balloons.)

The results of 10 balloon flights with counter telescopes and of 24 flights with single counters are represented. It was found that a nearly unique correlation exists between the counting rate in a certain altitude and the counting rate of the neutron monitor on ground if only galactic radiation impinges at the top of the atmosphere. The counting rates of the single counter scatter in a more pronounced manner with respect to the average expectation values related to the neutron counting rates than those of the telescope. This is considered as due to the influence of meson decay along the very extended paths traversed by particles arriving from strongly inclined directions. These are accepted by the single counter with its larger aperture in contrast to the telescope which responds only to particles arriving in a narrower cone centered around the vertical. (Author)

AD-273 633 Div. 20
(TISTB/CCH) OTS price $1.60

Naval Radiological Defense Lab., San Francisco, Calif.
RESIDUAL INJURY CAUSED BY IRRADIATION WITH FAST NEUTRONS,
by J. S. Krebs and R. W. Brauer. 26 Feb 62, 22p. incl. illus. tables. (NRDL-TR-550)
Unclassified report

DESCRIPTORS: (*Radiation injuries, Fast neutrons, Dose rate, Analysis.) (*X-rays, Radiation tolerance, Measurement.)

The LD50 of C3H female mice for fission-spectrum neutrons was 274.5 ±4.2 rad. The previously reported value in the same mice for 250 kvp X-ray was 632 rad, giving an RBE of 2.30. Conditioning exposure of the mice to a total neutron dose of 482.3 ±7.2 rad over an interval of 8-10 weeks resulted in lowering the LD50 for neutrons by 41.8 ±5.9 rad, or 8.67 ± 1.23% of the total conditioning dose. The previously reported value in the same mice for 250 kvp X-ray was 9.58% of the conditioning dose. Continued exposure of the mice to 166 rad doses of neutrons at intervals of 4-5 weeks gave a median survival time of 22 weeks. This was greater than that produced by exposure to 420 rad and less than that produced by exposure to 280 rad of 250 kvp X-ray given at the same time. The RBE of the mice for residual radiation injury and the RBE for chronic radiation tolerance over short time intervals are described as the same as that for acute injury tolerance. (Author)

AD-273 636 Div. 20, 14
(TISTP/TL) OTS price $2.60

Naval Radiological Defense Lab., San Francisco, Calif.
EFFECT OF CURE UPON CROSSLINKING, CHAIN SCISSION, AND COMPRESSION SET IN AN IRRADIATED RUBBER VULCANIZATE,
by W. E. Shelberg and J. F. Pestaner. 10 Jan 62, 24p. incl. illus. tables, 6 refs. (NRDL-TR-547)
(Proj. S-R007 11 01)
Unclassified report

DESCRIPTORS: (*Vulcanizates, Additives, *Elastomers, *Radioactivation analysis, *Rubber, *Radiation effects, Gamma emisson.)

The analysis deals with the effect of additives and cure on compression set, crosslinking, and chain scission in an irradiated rubber vulcanizate. It is part of a continuing investigation on the interaction of nuclear radiation with elastomeric materials. These elastomers are of interest for their possible use as component parts of devices which may be used in prolonged or intense nuclear radiation fields on earth or in space. (Author)

AD-273 641 Div. 20, 15
(TISTP/TL) OTS price $6.60

General Dynamics/Fort Worth, Tex.
THE APPLICATION OF INVARIANT IMBEDDING TO SHIELDING PROBLEMS,
by R. E. Beissner. 9 Mar 62, 70p. incl. illus. 9 refs. (Document no. MR-N-287; NARF-61-41T)
(Contract AF 33(657)7201)
Unclassified report

DESCRIPTORS: (*Neutrons and Gamma rays, *Shielding, Transmission, Reflection, Transport properties.) (Particles, Penetration, Embedding substances.) (Matrix algebra, Difference equations, Numerical analysis, Integration.)

The fundamental concepts of the theory of invariant imbedding as applied to particle transport processes are reviewed and their applications to shielding problems are discussed. Two new approximate methods for predicting the transmission of particles through slabs of material are derived from the imbedding equations. One-velocity computations of the angular distributions of particles reflected and transmitted by slabs of varying thickness and composition are presented and analyzed.

AD-273 651 Div. 20
(TISTP/TL) OTS price $2.60

Space Technology Labs., Inc., Los Angeles, Calif.
AVERAGE NUMBER OF NUCLEONS IN COSMIC RAYS INDUCED NUCLEON CASCADES,
by Bruce L. Scott. Feb 62, 21p. incl. illus. 10 refs. (Rept. no. 6120-7257-NU-000)
(Contract AF 04(694)01)
(BSD TDR 62-16) Unclassified report

DESCRIPTORS: (*Cosmic rays, Inelastic scattering.) (Proton scattering of *Nucleons in Nuclei, Cosmic rays.) Mesons.

This is a preliminary analysis on studies dealing with various effects of cosmic rays on matter. In particular, this analysis will be concerned with the development of nucleon cascades especially the similarities and differences in their development in various materials. (Author)

AD-273 673 Div. 20, 25
(TISTP/WH) OTS price $8.60

Aerospace Corp., El Segundo, Calif.
THE KINETICS OF IONIZATION PROCESSES IN GASES,
by Howard Myers. Dec 61, 89p. incl. illus. tables, refs. (Rept. no. TDR-930(2119)TR-2)
(Contract AF 04(647)930)
Unclassified report

DESCRIPTORS: (*Ionization, *Reaction kinetics, *Dissociation, *Recombination reactions.) (Gas ionization, Rare gases, Molecular association.) (Measurement of Ionization based on Electrostatics, Microwaves, Mass spectrometers.)

Currently available knowledge of the kinetics of ionization is presented. The production of ionization is covered by a description of electrical discharges in gases, including direct and alternating current discharges. Photoionization and ionization by shock waves are described. The measurement of ionization includes a description of electrostatic probes, microwave probing signals, mass spectrometer probe and shock tubes. Photoionization instrumentation is described. Results of kinetic investigations are presented and the ionization processes occurring in the atmosphere are analyzed. (Author)

AD-273 694 Div. 20, 25
(TISTP/WH) OTS price $18.00

Geophysics Corp. of America, Boston, Mass.
STUDY OF RECOMBINATION PHENOMENA. VOLUME II. RECOMBINATION IN PLASMA.
Final rept. vol. 2,
by E. Ashley, A. Dalgarno and others. Feb 62, 280p. incl. illus. tables, 96 refs. (GCA Technical rept. no. 62-4-A)
(Contract AF 29(601)4143, Proj. 4988)
(AFSWC TDR 62-11, vol. 2)
Unclassified report

DESCRIPTORS: (High altitude, *Atomic bomb explosions.) (Fission products, Ionization, *Recombination reactions.) (Plasma physics, Recombination reactions.) Hydrogen.

Volume I of this report (AD-328 623) discussed the radiative and collisional processes which determine the recombination rate in a plasma. A general expression was derived for the recombination rate, and numerical values were given for a hydrogen plasma in the temperature range 250 K to 64,000 K and for all electron densities. These results were applied to an expanding hydrogen plasma and to the expanding debris from a nuclear explosion, and indicated that in an explosion occurring in a vacuum, significant recombination may take place at times later than a millisecond after the detonation. Volume II contains seven papers dealing with the physics of recombination in plasmas. Included are the radiative transition probabilities for a number of atoms and ions obtained from a theory of atomic screening constant. (Author)

AD-273 756 Div. 20, 25, 8
(TISTP/JW) OTS price $2.60

Air Force Cambridge Research Labs., Bedford, Mass.
NUCLEAR MAGNETIC RESONANCE IN FLAMES,
by Darrell R. Parnell. Feb 62, 23p. incl. illus. 6 refs. (AFCRL 62-51)
(Proj. no. 4649)
Unclassified report

DESCRIPTORS: (*Nuclear magnetic resonance in Exhaust gases and *Exhaust flames from Jet engines.) (Thermal radiation *Nuclear spins, Nuclear states, Quantum mechanics, Excitation.)

In the thermal generation of nuclear magnetic resonance phenomena, such as is found in flames or hot exhausts, energy is lost during the transition from a higher- to a lower-energy nuclear magnetic quantum state. The interaction that takes place is explained in simple theoretical terms, and the effects of resonance broadening by spin-spin interaction and an inhomogeneous magnetic field are considered. The amount of energy lost during the cooling of a hot jet exhaust was calculated using the environmental magnetic field of the earth. On the assumption that the energy was radiated by means of electromagnetic waves, attempts were made to detect this energy loss. (Author)

AD-273 825 Div. 20, 22
(TISTW/EET) OTS price $3.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
THE DETECTION AND IDENTIFICATION OF UNDERGROUND NUCLEAR EXPLOSIONS: A STUDY,
by George L. Turin. 2 Mar 62, 32p. incl. illus. 29 refs. (Rept. no. 34G-2)
(Contract AF 19(604)7400)
(AFESD TDR 62-68) Unclassified report

DESCRIPTORS: (Feasibility studies for the Detection and Identification of *Underground explosions.) (*Nuclear explosions, Seismological stations, Low frequency, *Electromagnetic waves, Seismic waves.) (Detection of Atomic bomb explosions.)

An investigation has been made concerning the problems involved in the detection and identification of underground nuclear explosions. A brief summary of the history of recent interest in the problem is given. A discussion of phenomena associated with an underground explosion is presented. Of these phenomena, two are discussed in detail: low-frequency electromagnetic disturbances and seismic disturbances. Some of the pertinent facts of seismology, various possible seismic methods of detecting underground explosions and distinguishing them from earthquakes are presented in detail.

AD-273 861 Div. 20, 8
(TISTP/WH) OTS price $10.50

Hughes Aircraft Co., Culver City, Calif.
RESEARCH STUDY OF SURFACE BARRIER DETECTORS.
Final rept., 31 Dec 60-28 Feb 62.
28 Feb 62, 124p. incl. illus. tables, 22 refs.
(Contract DA 49-146-XZ-016)
(DASA-1275) Unclassified report

DESCRIPTORS: (Measurement of *Neutron flux density with *Transistors of Silicon.) (Radiation counters, *Neutron capture gamma rays, Thermal neutrons, Fast neutrons.) (Transistors, Ionization, Radiation effects.) (Neutron scattering, Dosimeters, Radiation counters.)

The purpose of the study was to determine the feasibility of utilizing p-n junction phosphorous-diffused detectors to map the radiation field of a pulsed reactor and a linear accelerator. The detectors produced large signals in these radiation fields which were easily observed without any amplification. Radiation from the

reactor flux had a damaging effect on the detector characteristics. These were examined before and after the irradiations at temperatures ranging from 77 to 325 K. No permanent effects were observed from the gamma-ray field of the linear accelerator at dosages up to 100,000. The fabrication of very thin detectors of dE/dx determinations using charged particles and for rapid response to a LINAC beam is examined. The p-n junction detectors used were made by diffusing phosphorous into boron-doped silicon wafers of various resistivities. (Author)

21. NUCLEAR PROPULSION

No Entries

22. ORDNANCE

AD-273 493 Div. 22, 14, 17, 30
(TISTW/JRG) OTS price $2.60

Technical Operations, Inc., Burlington, Mass.
HYPERVELOCITY PARTICLE EFFECTS ON MATERIAL.
Quarterly progress rept. no. 3,
by Victor E. Scherrer and Robert R. McMath.
15 Mar 62, 24p. incl. illus. 2 refs. (Rept. no. TO-B-62-12)
(Contract AF 33(616)8423)
Unclassified report

DESCRIPTORS: (Terminal ballistics, *Cratering, Effects of Mylar, Plastics, Copper and Aluminum, *Hypervelocity projectiles and Disc-shaped *Particles on Lead, Targets.) (Hypervelocity guns, Instrumentation for Acceleration of Particles.) High-speed photography, Photographic analysis, Capacitors.

Research is continuing on hypervelocity particle effects on materials: Two major advances were made: (1) Higher particle velocities were attained by using a special fast-discharge capacitor; and (2) hypervelocity data were obtained using Cu and Al particles. In addition, new diagnostic experiments were conducted to study the exploding wire gun. Mylar particles were accelerated to a velocity of 102,000 ft/sec. Good single-particle impacts were obtained. Some ablation of the particle (initial mass of 11 mg) occurred. Extensive data of Al- and Cu-particle impacts on quasi-infinite Pb targets were taken. It is concluded that (for particle velocities above a certain level) the same crater shape is obtained for the disc-shaped particles that is obtained for spherical particles (or projectiles) by other researchers. (Author)

AD-273 548 Div. 22, 8
(TISTW/EET) OTS price $1.60

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
DEVELOPMENT OF A UNIVERSAL RADIO FREQUENCY PROTECTED SQUIB.
Quarterly progress rept. no. 2, 1 Oct-31 Dec 61, by Paul F. Mohrbach and Melvin R. Smith.
31 Dec 61, 15p. incl. illus. tables (Rept. no. Q-B1856-2)
(Contract N178-7902)
Unclassified report

DESCRIPTORS: (*Electric detonators, *Electric igniters, Electromagnetic waves, Hazards.) (*Electronic circuits, *Radiofrequency filters, Low-pass filters, Radiofrequency attenuators, Radiofrequency transformers, Radiofrequency coils, Design, Safety devices, Effectiveness.) Transistors, Electronic switches, Diodes.

Experiments were conducted to determine if it is possible to attenuate RF energy in a transmission line by coupling the line to a transformer with a lossy core. This device was designed specifically to provide high core loss and eddy current loss. Tests over the frequency range from 20 kc to 1 Mc indicated that adequate RF protection could be provided for an electroexplosive device having a 1-ohm bridge wire. It was possible to fire Mk 1 mod 0 squibs through the transformers with a 2 millisecond pulse of 14 volts magnitude. Dissipative filters of various types showed promise. An analog computer is being used to evaluate these filters and gain information as to arrangements which would give as much RF attenuation as possible without unduly reducing the firing sensitivity of an electroexplosive device. The evaluation of solid state devices was continued, but only transistor switching circuits showed promise. (Author)

AD-273 560 Div. 22, 24
(TISTW/JRG) OTS price $1.60

Naval Ordnance Test Station, China Lake, Calif.
A PORTABLE, BLAST-CONTAINED, EXPLOSIVE LIGHT SOURCE FOR HIGH-SPEED SHADOWGRAPHS,
by Rolland Gallup. 21 Feb 62, 14p. incl. illus. 5 refs. (NOTS TP 2862)
(NAVWEPS rept. no. 7880)
Unclassified report

DESCRIPTORS: (Design of *Explosives, *Light, Sources in an Argon, Atmosphere for use in *Spark shadowgraph photography of Supersonic flow of Air through Glass, Nozzles.) High speed photography.

An explosive light source for shadowgraph use is described which employs a preassembled self-capping light bomb contained in a portable bomb chamber and overpressure housing. Its use is discussed in terms of an actual test, that of microsecond exposure shadowgraphs of a supersonic air flow through a 2-dimensional glass-walled nozzle. Test results are presented. (Author)

AD-273 644 Div. 22, 8
(TISTW/JRG) OTS price $2.60

Ammunition Group, Picatinny Arsenal, Dover, N. J.
RHOMBIC ANTENNA THEORY AS AN APPROACH TO DETERMINING THE R-F SUSCEPTIBILITY OF ELECTRO-EXPLO-

SIVE DEVICES,
by Jay L. Politzer, Mar 62, 26p. incl. illus. 4 refs. (Technical memo. rept. no. ORDBB-DR1-5)
Unclassified report

DESCRIPTORS: (Theory of Rhombic, *Antennas for Determination of the *Electromagnetic waves, *Radiofrequency, Sensitivity, Hazards and Safety, Distances for *Electric detonators.) Radar equipment, Electromagnetic fields, Hazards.

A novel technique for determining the RF susceptibility of electroexplosive devices is presented. The technique is general enough to be of value in any case where the electroexplosive device may be considered to be part of a rhombic antenna circuit. An artificial index of the relative sensitivities of antennas, called the configuration index, is discussed. This quantity is easily calculable knowing the geometry of the antenna and the frequency of the impinging radiation. Using the configuration index, graphs may be drawn from empirical data of the index vs power density for a no-fire condition at any frequency. From these graphs, the safe separation distance of electroexplosive devices from the RF source may be determined for rhombic circuits. (Author)

AD-273 717 Div. 22, 12
(TISTW/JRG) OTS price $5.60

Naval Ordnance Test Station, China Lake, Calif.
WATER-EXIT BEHAVIOR OF MISSILES. PART 1. PRELIMINARY STUDIES,
by J. G. Waugh and G. W. Stubstad. 11 May 61, 54p. incl. illus. tables, 9 refs. (NOTS TP 2693)
(NAVWEPS rept. no. 7735)
Unclassified report

DESCRIPTORS: (*Photographic analysis of *Cavitation obtained from Model tests of the Water exit of *Guided missiles.) (Launching, Guided missiles, Underwater to surface.)

Water-exit launchings were made with a 2-in. diam hemisphere-head missile at 60-fps nominal water-exit velocity, launching angles of 15, 30, and 90 degrees with respect to the horizontal, and different degrees of cavitation ranging from nearly fully wetted flow to completely enveloping cavitation. Perturbations in missile pitch at water exit increased with decreases in trajectory angle and the max perturbations occurred under conditions of fully developed cavitation. From the results it is inferred that water-exit perturbations will pose problems in service missile water-exit technology. The addition of a nose probe to measure cavitating missile attitudes altered the water-exit perturbations and sometimes caused erratic cavities to form. An annular groove in the missile nose at the zone of cavity separation stabilized the cavity and allowed more consistent results to be obtained. (Author)

AD-273 834 Div. 22
(TISTW/JRG) OTS price $7.60

Frankford Arsenal, Philadelphia, Pa.
DESCRIPTION AND OPERATION OF A HAND HELD WIRE GUN,
by A. J. Grandy and J. W. Hettel. Feb 62, 71p. incl. illus. 2 refs. (Memo. rept. no. M62-19-1)
(Proj. 596-10-001)
Unclassified report

DESCRIPTORS: (Design and Operation of *Small arms, *Guns used in firing *Barbed wire for Control of Personnel.) Wire, Containers, Packaging.

AD-273 864 Div. 22
(TISTW/EET) OTS price $6.60

Scintilla Magneto Div., Bendix Corp., Sidney, N. Y.
SQUIB DEVELOPMENT PROGRAM TO U. S. NAVAL WEAPONS LABORATORY, DAHLGREN, VIRGINIA.
Final rept.,
by R. M. Purdy. 15 Feb 62, 20p. incl. illus. tables.
(Contract N178-7770)
Unclassified report

DESCRIPTORS: (*Electric detonators, *Electric igniters, Radiofrequency, Electrodes, Embedding substances, Molding materials, Graphite, Epoxy resins, Antimony, Barium compounds, Nitrates, Zirconium, Resistance, Coatings, Manufacturing methods, Processing.) Igniters, Sparks, Electric currents, Spark ignition.

This report includes:
EVALUATION OF SPARK GAP SQUIBS.
Final rept., by Paul F. Mohrbach and Raymond R. Raksnis. Jan 62, (Rept. no. F-B1907-1)

Studies were made concerning the feasibility of using a spark gap shunted by a semi-conducting material in an electro-explosive device to render it immune to stray RF. Squibs were made utilizing a .030 in. spark gap, the electrodes of which were embedded in a graphite-epoxy molding compound. A two-fold function of the squib body was thus achieved; i.e., (1) a heat sink, and (2) a shunt. An additional shunt consisting of a thin antimony film was applied across the face of the spark gap. It was shown that such a device having a total resistance across the gap of .4 ohms requires 28 - 30 watts of RF to fire. A similar value of DC is also required to fire the squib. Barium nitrate-zirconium was used as an explosive mix. A power pack for firing the squibs was built. This provides a 1000 volt condenser discharge theoretically of 2 joules of energy and actually some 158,000 peak watts across the spark gap. (Author)

23. PERSONNEL AND TRAINING

AD-273 891 Div. 23
(TISTB/AM) OTS price $8.10

American Inst. for Research, Pittsburgh, Pa.
EFFECTIVENESS OF INTEGRATED FLIGHT SIMULATOR TRAINING IN PROMOTING B-52 CREW COORDINATION.
Rept. for Sep 58-Jan 61 on Training, Personnel, and Psychological Stress Aspects of Bioastronautics,
by Richard L. Krumm and Alfred J. Farina, Jr.
Feb 62, 79p. incl. illus. tables, 3 refs.
(Contract AF 33(616)7011, Proj. 1710)
(MRL TDR 62-1) Unclassified report

DESCRIPTORS: (*Flight simulators, Training devices, Effectiveness.) (Group dynamics, Measurement, Pilots, Navigators.)

This report represents the findings of a study designed to assess the value of a B-52 flight simulator electronically linked to a T-2a navigator trainer in promoting crew coordination. Seventy-five SAC aircrews undergoing B-52 transition training at Castle Air Force Base were used as subjects. Integrated and non-integrated simulator training of these crews was contrasted. The results as indicated by certain of the measures used enable a favorable recommendation to be made regarding the effectiveness of the B-52 integrated crew trainer. Special attention is devoted to a discussion of two aspects of communication, pattern and volume, and the relation of these aspects to crew coordination. (Author)

24. PHOTOGRAPHY AND OTHER REPRODUCTION PROCESSES

AD-273 635 Div. 24, 15
(TISTP/TL) OTS price $7.60

Naval Ordnance Test Station, China Lake, Calif.
CINETHEODOLITE EVALUATION PROGRAM: CALIBRATION PROCEDURES,
by E. E. Curry, and R. W. Mace. 1 July 61, 72p. incl. illus. tables.
(NOTS TP 2747)
(NAVWEPS rept. no. 7768)
Unclassified report

DESCRIPTORS: (*Phototheodolites, *Calibration, Errors, Standards.) (Collimators, *Photographic equipment, Instrumentation, Azimuth, Recording devices, Measurement.) (Trigonometry, Least squares method, Harmonic analysis, Transformations, Matrix algebra.)

This analysis describes current NOTS cinetheodolite calibrations performed in the field with portable equipment. It is divided into six sections. Section I briefly describes cinetheodolite errors. Section II treats these errors mathematically. Section III is an outline for setting up the measuring equipment and recording the measurements. Sections IV and V discuss the methods for reducing the measurements to camera constants used in the IBM cinetheodolite solution, and the procedures for calculating these constants with the IBM 7090. Section VI is a general discussion. (Author)

AD-273 760 Div. 24, 30, 20, 2
(TISTA/VGW) OTS price $2.00

Edgerton, Germeshausen and Grier, Inc., Boston, Mass.
TECHNICAL PHOTOGRAPHY OF SURFACE MOTION.
Preliminary rept. on Plowshare Program, Project Gnome,
by J. Heffernan and D. Barnes. Jan 62, 68p. incl. illus. tables (Rept. no. VUP-2202)
Unclassified report

DESCRIPTORS: (*Photographic recording systems for Photographic analysis of Motion of Earth, Surfaces after *Underground explosions, *Nuclear explosions, Tests, Effectiveness, Data, Tables.)

The technical photography of surface motion obtained during the Gnome event, is reported. The project entailed photographic recording of earth motion in and around the Surface Zero area, processing of the resultant film records, production of requested prints, analysis of the photographic records, and submission of the resultant data. The earth motion was recorded photographically from a distance by cameras equipped with long-focal length lenses and close-in by use of special inertia-weight instrumentation. In the long-range photography, the displacement of target arrays anchored in and around Surface Zero was photographed by cameras which were placed far enough distant to have finished recording the maximum earth motion before arrival of the shock wave. With the inertia-weight instrumentation, close-in, shock-mounted cameras recorded the displacement of marked targets in relation to a spring-suspended inertia-weight which remained essentially motionless during the time of interest. All but one of the 15 cameras used to document the earth motion operated well on the Gnome event and good records were obtained. (Author)

AD-273 818 Div. 24, 18
(TISTW/DLW) OTS price $15.50

Goodyear Aircraft Corp., Akron, Ohio.
ELECTRONIC CORRELATION TECHNIQUES FOR TARGET RECOGNITION.
Final rept., Mar-Dec 61.
9 Jan 62, 221p. incl. illus. tables, 6 refs.
(Rept. no. GER-10449)
(Contract AF 30(602)2459, Proj. 6244)
(RADC TDR 62-41) Unclassified report

DESCRIPTORS: (*Aerial photography, *Aerial reconnaissance, Photographic intelligence, Surface targets, Identification, Detection, Target recognition.) (*Aerial photographs, Data processing systems, Automatic, *Correlation techniques, Photographic analysis.)

The target recognition problem was approached analytically, experimentally, and through photographic examination of target attributes. Aerial photographs of runways, petroleum refineries, and industrial complexes provided attribute data on which part of the analytical and experimental studies were based. The detection of petroleum refineries in the spatial frequency domain and of industrial complexes in the time domain were investigated analytically. Correlation surfaces of targets and a slit template were studied experimentally. A width-gating device was constructed and the extraction of straight-line patterns from their backgrounds on the basis of the width attribute was demonstrated. Three suggested systems for the detection of straight-line patterns and the recognition of runways are described, and a system for the detection of irregular pattern areas is defined. (Author)

25. PHYSICS

AD-273 463 Div. 25, 15
(TISTP/MFA) OTS price $1.00

National Bureau of Standards, Boulder, Colo.
EVALUATION OF CONVOLUTION INTEGRALS OCCURRING IN THE THEORY OF MIXED PATH PROPAGATION.
Rept. on Antenna Patterns in the Presence of Finite Ground Surfaces,
by J. R. Johler and C. M. Lilley. 15 Oct 61, 20p. incl. illus. 18 refs. (Scientific rept. no. 14; PB 161633; Technical note no. 132)
(AFCRL-394)

Unclassified report

DESCRIPTORS: (Theory of *Propagation of *Electromagnetic waves around *Spheres, Earth.) (*Terrestrial magnetism, Conductivity, Dielectrics, Attenuation.) (*Wave analysis, Polynomials, Integral equations, Transformations (Mathematics).) Numerical analysis by Computers.

The theory of propagation of electromagnetic waves around a sphere treats the smooth homogeneous case, i.e., the case in which the surface impedance of the sphere is uninterrupted by an abrupt change in conductivity such as a land/sea boundary. It is known, however, that such a theory can be extended to treat inhomogeneous, irregular terrain by formulating certain convolution integrals which utilize the smooth homogeneous formulas. The evaluation of these integrals can be accomplished with dispatch on a large-scale electronic computer with the aid of numerical analysis techniques. (Author)

AD-273 467 Div. 25, 15
(TISTP/MFA) OTS price $3.60

United Aircraft Corp, East Hartford, Conn.
METHODS FOR CALCULATING RADIANT HEAT TRANSFER IN HIGH-TEMPERATURE HYDROGEN GAS,
by Richard W. Patch. Nov 61, 32p. incl. illus. table, 16 refs. (Rept. no. M-1492-1)
(Contract AF 04(611)7448)

Unclassified report

DESCRIPTORS: (Measurement of *Heat transfer by *Thermal radiation in Hydrogen, *High temperature research.) (Blackbody radiation, Absorption, *Transport properties, Analysis.) (Digital computers, Programming for Density, Energy, Temperature, Pressure.) (Taylor's series, Integrals.)

A digital computer program was developed to determine heat transfer by thermal radiation in any gas with one-dimensional or axisymmetric temperature and pressure distributions. Heat transfer was calculated for a one-dimensional case with two black-body boundaries and a monotonically increasing temperature. The calculations were made with hydrogen throughout the space between the boundaries and with a grey gas added to the hydrogen at the high-temperature end. Conclusions are as follows: (1) In gases the radiant heat flux densities determined by a diffusion analysis may be in error by several orders of magnitude for cases having steep temperature gradients and low absorption coefficients. (2) Accurate values of radiant heat flux density can be obtained for all cases by employing a transport analysis and using sufficiently small increments in the numerical integration procedure. (3) The use of a diffusion analysis for calculations where the absorption coefficient is high and a transport analysis where the absorption coefficient is low is the most practical method of solution for a general digital computer program. (4) The bound-free absorption of the H ion is the most important contributor to the absorption coefficient of hydrogen at 100 atm between 6000 K and 12,000 K. (Author)

AD-273 488 Div. 25, 12, 7
(TISTP/JW) OTS price $2.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
DEVELOPMENT OF A GAS GENERATOR USING A ROCKET-TYPE COMBUSTOR AS THE HEAT SOURCE,
by C. T. Carman. Mar 62, 19p. incl. illus. 2 refs. (Rept. no. AEDC TDR 62-15)
(Contract AF 40(600)800)

Unclassified report

DESCRIPTORS: (Combustion chambers, Combustion chamber gases, Water, *Steam.) (Rocket motors, Exhaust gases, Jet mixing flow, Steam.) (*Rocket laboratories, Instrumentation, Specific impulse.) *Gas generating systems.

An investigation was conducted to determine the feasibility of producing large quantities of gas as the driving medium of steam ejectors by directly mixing water with the exhaust gas stream of a rocket-type combustion chamber. The feasibility of producing large quantities of steam-gas mixture was demonstrated. Gas with specific humidities below the saturated value was more suitable as an ejector driving fluid than saturated mixtures. The evaporative efficiency of the rocket steam generating rig was in the range from 91 to 103 percent. (Author)

AD-273 492 Div. 25, 15, 2
(TISTP/MFA) OTS price $1.60

Boeing Scientific Research Labs., Seattle, Wash.
EXTREMELY LOW FREQUENCY WAVES IN AN INHOMOGENEOUS HYDROMAGNETIC MEDIUM AND GEOMAGNETIC MICROPULSATIONS,
by William C. Hoffman. Jan 62, 16p. incl. illus. 12 refs. (Mathematical note no. 248; Document no. D1-82-0150)

Unclassified report

Also available from author.

DESCRIPTORS: (*Magnetohydrodynamics, *Extremely low frequency, *Electromagnetic waves, Magnetic fields, Oscillations, Conductivity, Waves.) (*Terrestrial magnetism, *Solar disturbances, *Fluid flow.) (Transformations (Mathematics), Partial differential equations, Perturbation theory.)

A new type of wave motion is described which can exist in an inhomogeneous hydromagnetic medium at extremely low frequencies under certain conditions on the conductivity gradient of the medium. The basic hydromagnetic equations consist of Maxwell's equations, Ohm's law, an equation of motion for a non-viscous medium, and the equation of continuity. (Author)

Division 25 - PHYSICS

AD-273 495 Div. 25
(TISTP/JW) OTS price $11.00

Institute of Engineering Research, U. of Calif., Berkeley.
AN EXPERIMENTAL INVESTIGATION OF FREE MOLECULE MOMENTUM TRANSFER BETWEEN GASES AND METALLIC SURFACES.
Doctoral thesis,
by Robert Erwin Stickney. 25 Jan 62, 145p. incl. illus. tables, 31 refs. (Rept. no. HE-150-182; Series no. 20, Issue no. 134)
(Contract Nonr-22245)
Unclassified report

DESCRIPTORS: (Helium, Hydrogen, Neon, Nitrogen, Carbon dioxide, Platinum, Tungsten, Energy, Motion, *Heat transfer, *Temperature coefficient of reactivity.) (Molecules, *Kinetic theory, Metals, Surfaces.)

Measurements of the normal momentum transfer between gases and metallic surfaces were obtained under conditions of free molecule flow by means of a torsion balance and molecular beam apparatus. Helium, hydrogen, neon, nitrogen, argon, and carbon dioxide were investigated on tungsten, platinum-blackened-tungsten, platinum, and aluminum surfaces which were most likely contaminated with oxides and adsorbed gases. Momentum transfer measurements were obtained with the surface at various temperatures, the range being from 25 to 550 C. The efficiency of the momentum transfer process increases with the molecular weight of the test gas and the roughness of the test surface, but is relatively independent of the surface material under the present conditions. The momentum transfer rates for helium and hydrogen are significantly less than for the heavier gases. The accommodation to the surface temperature is incomplete except, possibly, for argon and carbon dioxide. The results were used to estimate the values of the coefficient of translational energy transfer and a modified form of the coefficient of normal momentum transfer. (Author)

AD-273 497 Div. 25, 2
(TISTP/MFA) OTS price $2.60

Hebrew U. (Israel).
PARAMAGNETIC RESONANCE OF RARE EARTH IONS WITH AN ISOLATED LEVEL GROUND STATE,
by W. Low and G. Vincow. Dec 61, 18p. incl. illus. tables, 14 refs. (Technical note no. 17)
(Contract AF 61(052)59)
(AFOSR-2114) Unclassified report

DESCRIPTORS: (*Paramagnetic resonance of Rare earths, Ions in Crystal structure of *Neodymium and *Uranium, Isotopes in *Fluorspar.) (*Hyperfine structure, Atomic spectrum, Molecular rotation.) (Thermal diffusion, Transport properties.)

In rare earth ions it is often found that the ground state consists of a degenerate quartet. Cases when this may occur are discussed. The spin Hamiltonian is solved for the particular case of f3 and the angular variation as well as the transition probabilities are computed. The theoretical calculations are compared with the experimental data obtained for Nd3+ and U3+ in cubic sites of CaF2. A short description on the thermal treatment is given. (Author)

AD-273 514 Div. 25
(TISTE/NTM) OTS price $8.10

Assistant Secretary of Defense (Research and Engineering), Washington, D. C.
SHOCK, VIBRATION AND ASSOCIATED ENVIRONMENTS. PART II.
Jan 62, 84p. incl. illus. tables, refs. (Bulletin no. 30, pt. 2)
Unclassified report

The 30th Symposium on Shock, Vibration, and Associated Environments was held at the Statler-Hilton Hotel, Detroit, Michigan on October 10-12, 1961.

DESCRIPTORS: (*Symposia, *Bibliography, *Shock, *Vibration, *Acoustic impedance.) (Vibration isolators, Mechanical properties, Resistance to Motion, Dynamics, Damping, Effectiveness.) (Acoustic impedance, Measurement, Instrumentation, Transducers, Calibration, Sensitivity, Mathematical analysis.)

Contents:
Analytical determination of mechanical impedance
Instruments and methods for measuring mechanical impedance
Applications of impedance information
Application of mechanical admittance data to the solution of a practical problem
Structural response to dynamic load

AD-273 533 Div. 25, 8
(TISTM/EJH) OTS price $7.60

Allied Research Associates, Inc., Boston, Mass.
STUDY OF MATERIALS FOR THERMIONIC CONVERTERS.
Summary rept. no. 1,
by Philip Goodman and Harold Homonoff. 31 Dec 61, 80p. incl. illus. tables, 113 refs. (Document no. ARA-1029)
(Contract Nonr-338500)
Unclassified report

DESCRIPTORS: (*Thermionic emission, Thermodynamics, Thermal conductivity, *Work functions, Atomic energy levels, Electron transitions, Quantum mechanics, Materials, Semiconductors, Metallic compounds.) (Alkaline earth compounds, Oxides.) (Transition elements, Borides, Carbides, Nitrides.) (Rare earth compounds, Borides.) Solid state physics, Theory, Electric power production, Thermoelectricity.

This program was concerned with an examination of the fundamental properties of materials, from a solid-state physics and chemistry point of view, with regard to those properties which most influence their performance in thermionic converters. The underlying structural causes which determine the values of such material properties as work function, electron affinity, heat of vaporization, vapor pressure, thermal conductivity, Fermi level, etc. were examined for metals, insulators, and semiconductors. Both quantitative calculations and qualitative correlations for various material classes are discussed. In connection with this study, a compilation was made of experimentally determined thermionic work functions and Richardson A values for most non-elemental emitters. (Author)

AD-273 534 Div. 25, 15
(TISTP/MFA) OTS price $9.10

American Machine and Foundry Co., Niles, Ill.
A THEORETICAL STUDY OF RESPONSE OF SOLIDS TO IMPULSIVE LOADS OF HIGH PRESSURE.
Final rept.,
by Joseph J. Poczatek and L. E. Fugelso. Oct 61, 102p. incl. illus. table, 25 refs.
(Contract AF 29(601)2533, Proj. 4778)
(AFSWC TR 61-67) Unclassified report

DESCRIPTORS: (Wave transmission, *Stresses, *Blast (Loading), *Deformation, Elasticity, Plasticity, Mechanics.) (Dislocations of *Crystal structure, Lattices in Solids, *Rods, *Structural shells, Elastic shells.) (Potential theory, Partial differential equations, Harmonic analysis, Fourier analysis.) Continuum mechanics, Load distribution.

The response of materials and structures to pressures on the order of one megabar is considered. The problem is decomposed according to the characteristic response time for various failure modes. The short-time effects study analyzes propagation of these high-pressure pulses. General equations are developed for a solid under finite strain, with dissipation mechanism, heat conduction, and elasticity coefficients open to specification. The long-time effects study develops dynamic elastic-plastic deformation theory of solids utilizing dislocation theory. Continuum equations for the elastic-plastic displacements and stresses are derived. The elastic-plastic deformation equations are solved for three particular cases: (1) Propagation of a stress wave in a one-dimensional rod. (2) Deformation of a semi-infinite half space under a suddenly applied strip load. (3) Deformation of an infinitely long thin cylindrical shell under a suddenly applied strip load along a generator.

AD-273 536 Div. 25, 15
(TISTP/MFA) OTS price $1.60

Armour Research Foundation, Chicago, Ill.
SELF ORGANIZING NETWORKS.
Annual rept., 15 Feb 61-14 Feb 62,
by Scott H. Cameron. 14 Feb 62, 15p. incl. illus.
(Contract Nonr-339200, Proj. NR 048-165)
Unclassified report

DESCRIPTORS: (*Video networks, Design of *Optical equipment, Photoelectric cells, Photographic film, Optical filters, Flash lamps.) (*Mathematical logic, Sequences, Errors, Analysis.)

The initial phases of a program directed toward the realization of complex adaptive logical networks by optical means are described. The logical networks with which the research is concerned are comprised of threshold devices in various configurations. The general hypothesis which underlies the program is that networks of threshold devices can be designed which will be capable of useful application to pattern recognition problems of several types, provided that we can discover simple, inexpensive means for their manufacture. Still another notion which we accept is that effective solutions to such problems will be found not in terms of networks of fixed behavior, but in terms of networks whose parameters can be easily altered by suitable action principles or adaptive strategies. While the program has been aimed at problems of both a theoretical and hardware nature, the major effort during the initial phase has been directed at the realization of a simple optical device for adaptive pattern recognition. (Author)

AD-273 554 Div. 25
(TISTP/TL) OTS price $8.60

Illinois U., Urbana.
THE SCATTERING OF 11 MEV - 19 MEV MONOCHROMATIC GAMMA RAYS BY THE DEFORMED NUCLEUS, HO(165),
by P. A. Tipler, P. Axel and others. Feb 62, 89p. incl. illus. tables, 46 refs. (Technical rept. no. 33)
(Contract Nonr-183405)
Unclassified report

DESCRIPTORS: (*Gamma rays, Photons, Photonuclear reactions, *Scattering by *Holmium.) (Bremsstrahlung, Optical equipment, Monochromatic light, Electrons, Detectors.) (Resonance, Absorption.) Theses.

The measurement of the cross section at 135 degrees for scattering of gamma rays by holmium is described. The experiment used the bremsstrahlung monochromator at the 25 Mev betatron. A resolution of 0.6% and a maximum intensity of 10,000 gamma rays per second for each electron detector made it possible to look for structure in the giant resonance, and to compare the scattering cross section with the absorption cross section. (Author)

AD-273 559 Div. 25, 15
(TISTP/MFA) OTS price $10.10

Naval Ordnance Test Station, China Lake, Calif.
BLACK-BODY RADIATION FUNCTIONS,
by G. T. Stevenson. 1 Sep 61, 118p. incl. tables (NOTS TP 2623)
(NAVWEPS rept. no. 7621)
Unclassified report

DESCRIPTORS: Handbooks of *Blackbody radiation, *Functions, *Tables.

This report is an extension of the table of black body radiation functions from the American Institute of Physics Handbook, to include more places and additional intermediate values. (Author)

AD-273 588 Div. 25, 15
(TISTP/MFA) OTS price $1.10

Uppsala U. (Sweden).
COMPUTATION OF THE EMISSIVITY OF A CYLINDRICALLY SYMMETRIC LIGHT SOURCE FROM MEASUREMENTS OF THE PROJECTED INTENSITY PROFILE,
by S. I. Herlitz. 31 July 61, 8p. (Technical note no. 5)
(Contract AF 61(052)170)
(ARL-227) Unclassified report

DESCRIPTORS: (*Light transmission, *Light.) (*Least squares method, Polynomials, Fourier analysis, Functions.) Sweden.

A method is described for computing the emissivity of a cylindrically symmetric, optically thin light source, when the projected intensity profile is known from experiment. The unknown function is taken as a series expansion in terms of orthogonal polynomials, and it is shown how the expansion coefficients can be determined. This procedure yields a least-squares smoothed approximation. (Author)

AD-273 590 Div. 25, 20
(TISTP/JW) OTS price $1.60

Aerospace Corp., Los Angeles, Calif.
SPECTRAL RADIANCE AND EMISSIVITY OF PLASMA AND

Division 25 - PHYSICS

TEMPERATURE DETERMINATION,
by Allen E. Fuhs. 10 Jan 62, 9p. incl. illus. 3 refs. (Rept. no. TDR-930(2230-03)TN-2)
(Contract AF 04(647)930)
(DCAS TDR 62-10) Unclassified report

DESCRIPTORS: (*Plasma physics, Measurement of *Temperature.) (Blackbody radiation, Spectrographic analysis.)

A method used to determine the temperature of a flame is to measure its spectral radiance and spectral emissivity. The ratio of these two measured quantities provides a point on the blackbody curve, if the flame is effectively in equilibrium. Sufficient measurements are taken throughout a wavelength region to trace out an experimentally determined blackbody curve. This curve is compared with a series of curves that have been plotted by using different temperatures in Planck's radiation law. The temperature used to obtain the plotted curve that best coincides with the experimentally determined blackbody curve is designated as the flame temperature. The technique appears to be feasible for continuous plasma sources with temperatures up to about 15,000 K. The method provides a temperature determination procedure utilizing many different radiative processes. Hence, the temperature determined by this method reflects more clearly the energy content and energy distribution. (Author)

AD-273 591 Div. 25
(TISTP/MFA) OTS price $1.60

Aerospace Corp., Los Angeles, Calif.
ADDITIONAL APPLICATIONS OF THE ELECTRICAL CONDUCTIVITY VELOCITY METER,
by A. E. Fuhs. 19 Jan 62, 8p. incl. illus. 4 refs. (Rept. no. TDR-930(2230-03)TN-3)
(Contract AF 04(647)930)
(DCAS TDR 62-21) Unclassified report

DESCRIPTORS: (Measurement of Gas flow by Sensitivity of *Electrical conductance, *Instrumentation, Calibration.) (Transducers, Tests, Standards of *Ablation, *Materials, *Electrical properties.) (*Plasma jets, Gas ionization in Re-entry aerodynamics.)

By using the directional sensitivity of the electrical conductivity instrument with the E-lamination geometry, it is possible to measure the direction of the flow of a conducting gas. If only one coil set is used, a complex calibration procedure is necessary; however, by using two coil sets the flow angle becomes a function only of the ratio of the two signals. The second application involves the axial flow electrical conductivity transducer. To determine the relative contribution of different ablating materials to the electron density in the plasma sheath, a standard test is proposed. Tubes of various ablating materials are manufactured. A measurement of electrical conductivity-velocity product is obtained for each material under identical plasma source conditions. Comparison of the values may indicate, in a relative manner, the influence of the ablating material. (Author)

AD-273 592 Div. 25, 9
(TISTM/TCG) OTS price $3.60

Aerospace Corp., Los Angeles, Calif.
UNSTEADY LAMINAR FILM CONDENSATION ON VERTICAL PLATE,
by Paul M. Chung. 20 Nov 61, 33p. incl. illus. tables, 7 refs. (Rept. no. TDR-930(2230-01) TR-1)
(Contract AF 04(647)930)
(DCAS TDR 62-23) Unclassified report

DESCRIPTORS: (Liquids, *Films, Condensation and *Heat transfer in Metal plates, Sheets, Mathematical analysis by *Laminar boundary layer, Equations of state, Fluid mechanics, Fluid flow.)

The heat transfer associated with unsteady film condensation is analyzed for a vertical plate. The unsteady state is considered to be created by the time-dependent variation of either the uniform wall temperature or the g-force field. From the perturbation-type theoretical treatment, a set of universal variables and functions is derived which describes the unsteady behavior of the film. The universal functions are evaluated and tabulated so that the deviation of the heat transfer from the instantaneous steady state value can be computed readily. The effect of varying the fluid properties on the unsteady heat transfer is discussed. (Author)

AD-273 593 Div. 25
(TISTP/WH) OTS price $2.60

Aerospace Corp., Los Angeles, Calif.
AXIAL VIBRATIONS OF A WHIRLING BAR,
by P. G. Bhuta. 26 Feb 62, 18p. incl. illus. 3 refs. (Technical rept. no. TDR-930(2230-09) TN-4)
(Contract AF 04(647)930)
(DCAS TDR 62-31) Unclassified report

DESCRIPTORS: (*Vibrations, Resonance, Deformation of *Rotating structures.) (Equation of Motion, Differential equations.) Statics.

Axial vibrations of whirling bars are studied using undeformed coordinates. It is found that, in general, the effect of whirling is to lower the natural frequencies of the bars. For the static case an interesting result, which has not been previously reported, is obtained as a special case of the dynamic problem. When the angular velocity of the bar approaches certain critical values, static resonances occur and the axial displacements everywhere in the bar tend to become unboundedly large. These resonances are explained physically. The same problem is also worked out using final or deformed coordinates and it is shown that the static resonances cannot come out of such an analysis. Moreover, the rotation does not have any effect on the natural frequencies when deformed coordinates are used. The results of the analysis using undeformed coordinates appear to be more compatible with the physics of the problem. (Author)

AD-273 613 Div. 25, 4
(TISTP/WH) OTS price $3.60

Birmingham U. (Gt. Brit.).
RESEARCH ON IONISATIO CHARACTERISTICS OF EASILY IONISABLE CHEMICALS.
Final technical rept.,
by P. H. Batey. G. R. Court and J. Sayers.
1 Aug 61, 22p. incl. illus. 8 refs.
(Contract AF 61(052)269)
(AFCRL-1009)
Unclassified report

DESCRIPTORS: (*Ionization of Chemicals in *Ionosphere, Cesium, Vapors.) (Simulation of *Recombination reactions.) (Laboratories, Instrumentation, Mass spectrometers, Ionization chambers, Microwaves.)

A laboratory method is outlined for studying some of the low energy ionic reactions that are likely to occur when easily ionisable chemicals are released into the ionosphere. The possibility of resolving some of the discrepancies in previous measurements of relevant cross-sections is discussed. The design of apparatus to make measurements in afterglows using a time resolving mass spectrometer and a Langmuir probe is described, and the construction and initial measurements of performance of the mass spectrometer are given in detail. (Author)

AD-273 623 Div. 25
(TISTM/EJH) OTS price $4.60

General Electric Co., Schenectady, N. Y.
RESEARCH ON CdTe.
Quarterly progress rept. no. 3, 1 Nov 61-31 Jan 62,
by R. E. Halsted, M. R. Lorenz, and D. T. F. Marple. 31 Jan 62, 38p. incl. illus. refs.
(Contract AF 33(616)8264)
Unclassified report

DESCRIPTORS: (*Semiconductors, Intermetallic compounds, *Single crystals, *Cadmium compounds, *Tellurides, Phase studies, Melting, Growth, Zone melting, Temperature, Electron optics, Reflection, Absorption, Spectrographic analysis, Solid state physics.)

Optical and phase equilibria studies were continued and electron mobility measurements were initiated. Current measurements on free carrier absorption and reflection spectra will provide an optical determination of the electron effective mass. Reflectance measurements on pure crystals are being used to determine optical constants of CdTe between 4.0 and 7.4 ev at 25K. At 25K the 3.9 ev peak sharpens and structure appears in the 5.3 ev peak. CdTe phase equilibria studies have indicated that for every set of fixed component pressures there are 2 points in phase space where solid, liquid and vapor are in equilibrium. Two approaches to CdTe crystal growth were, therefore, indicated. At a fixed Cd pressure and within a given temperature range, it is possible to cool a liquid phase to obtain crystallization. Growth of CdTe crystals from a Cd rich solution under constant Cd pressure and increased melt temperature was also demonstrated.

AD-273 647 Div. 25, 4
(TISTM/EJH) OTS price $4.60

RIAS, Inc., Baltimore, Md.
ETCH-TUNNELS IN LITHIUM FLUORIDE CRYSTALS AND CONCERNING 'ANOMALOUS' SOLUTION AND ETCHING PHENOMENA.
Quarterly status rept. no. 3, 30 Sep-27 Dec 61,
by A. R. C. Westwood, H. Rubin and others.
27 Dec 61, 39p. incl. illus. 21 refs.
(Contract DA 36-034-505-ORD-3349)
(WAL TR-832/1-4) Unclassified report

DESCRIPTORS: (*Single crystals, Crystals, *Lithium compounds, *Fluorides, Growth, Deterioration, Corrosion, Solutions, Corrosive liquids, Fatty acids, Stearic acids, Chemical milling.)

The dissolution and growth behavior of LiF crystals in aqueous solutions containing long-chain fatty acids as step-poisons was investigated. Both positive-crystals (whiskers and platelets) and negative-crystals (etch-tunnels) can be grown respectively from supersaturated and undersaturated solutions of LiF containing identical concentrations of stearic acid (approximately 2 x 10 to the -6th power N.). Dissolution behavior in stagnant environments is of particular interest for etch-tunnels; some 0.5 microns in diameter and more than 100 microns in length (negative-whiskers) were observed. Two types of etch-tunnel can be distinguished; those nucleated at a surface defect - such as a cleavage step or the point of emergence of a dislocation (D-type) and those nucleated at apparently random points on the crystal surface (R-type). Metallographic observations reveal that dislocations are not essential to negative-crystal growth. (Author)

AD-273 650 Div. 25
(TISTP/TL) OTS price $1.60

Space Technology Labs., Inc., Redondo Beach, Calif.
GRAPHS OF THE REAL AND IMAGINARY PARTS OF THE EFFECTIVE COLLISION FREQUENCY FOR WEAKLY IONIZED AIR,
by Paul Molmud. Jan 62, 10p. incl. illus. 7 refs. (Rept. no. 8625-6001-RU-000; Scientific rept. no. 1)
(Contract AF 19(604)8844)
(AFCRL 62-55)
Unclassified report

DESCRIPTORS: (*Electromagnetic waves, Propagation in weakly *Ionization (ionized) *Air within Magnetic fields.) (Experimental data, Tables.) Numerical analysis.

Graphs of the real and imaginary parts of the effective collision frequency for air are presented. The propagation constants for an E.M. wave propagating in ionized air with a static magnetic field are presented in terms of these effective collision frequencies. A numerical example illustrating the use of these graphs is presented. (Author)

AD-273 652 Div. 25
(TISTA/LSK) OTS price $1.60

Space Technology Labs., Inc., Redondo Beach, Calif.
LIQUID-GAS INTERFACE IN ZERO-G.
Final rept.,
by L. Roennau. 31 Dec 61, 15p. incl. illus. table, 5 refs. (Rept. no 6101-6374-RU-000)
(Contract AF 04(694)1)
(BSD TDR 62-9)
Unclassified report

DESCRIPTORS: (Physical properties of *Liquefied gases during *Weightlessness, Atmosphere entry of Guided missile noses, Re-entry vehicle.) (Test equipment, Recovery.)

Efforts were made to study the behavior of a liquid-gas mixture in a zero-g field. Four experiment units were designed. Each unit houses a movie camera, so placed as to observe and record the interaction of air and water contained in a plastic cube during the 25-minute near-zero-g conditions present on an ICBM flight.

AD-273 654 Div. 25, 4, 30
(TISTM/GEC) OTS price $4.60

University Coll., London (Gt. Brit.).
ONE DIMENSIONAL X-RAY DIFFRACTION TECHNIQUES AS

Division 25 - PHYSICS

A ROUTINE STEREO-CHEMICAL TOOL.
Final technical rept. no. 1, 1 Nov 60-31 Oct 61, by R. S. Nyholm, Peter Pauling and others. Rev. 1 Nov 61, 41p. incl. illus. tables, 13 refs.
(Contract DA 91-591-EUC-1633)
Unclassified report

DESCRIPTORS: (*Stereochemistry, *X-ray diffraction analysis, *Powders, *Complex compounds, *Complex ions, Transition elements, Arsines, Pyridines, Halides, *Chelate compounds, Chromium compounds, Molybdenum compounds, Tungsten compounds, Molecular structure.)

An investigation was made to determine the structures of compounds or groups of compounds from a consideration of functions directly calculable from the x-ray diffraction patterns of powdered samples of the compounds. The study of coordination compounds and complex ions concerned the number and arrangement of ligands about the central coordinated metal ion. The investigation involved the preparation of techniques for showing that a compound or group of compounds had a particular coordination arrangement by considering and comparing the intensity distribution and radial distribution curves obtained experimentally from the compounds and by comparing the curves obtained from observable data with corresponding curves calculated from proposed molecular structures. X-ray powder diffraction photographs were taken of several series of compounds, the members of a series involving slight changes from one compound to another. These series included M dipyridine dihalide where M was a divalent transition metal; a series of cis and trans octahedral compounds; a series of eight coordinated compounds M bisdiarsine tetrachloride where M is Ti, V, Zr or Hf; and a series of compounds containing the complex ions $(MC16)(3-)$ or $(M2C19)(3-)$ where M is Cr, Mo or W. (Author)

AD-273 663 Div. 25, 30
(TISTP/WH) OTS price $6.60

Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
DIGITAL OPTICAL TRACKING SYSTEM,
by Albert J. F. Smith. Jan 62, 60p. incl. illus. tables (ASD TR 61-358)
(Proj. 6460)
Unclassified report

DESCRIPTORS: (*Theodolites, Motion picture cameras.) (*Analog-to-digital converters, Digital computers, Data processing systems.) (Tracking telescopes, Position finding.)

This space-position measurement system comprises two Askania Kth 53 cine-theodolite instruments with digital encoders mounted externally on their azimuth and elevation axes, readout electronic equipment including multitrack tape recording and playback subsystems, and a conversion subsystem for entering digital data in a Burroughs 205 computer. Digitally, angular position readings are possible to ±1 part in 32768, and by a small modification, can be extended for azimuth angles to ±1 part in 65536. Sampling rates are 1, 2, 4, 8, or 16 per second. Instrument dial angular position capability is five seconds of arc, for which film recordings are available for visual scanning. Time, recorded in binary code, is accumulated each 2-second period in groups of eight frames each. Time correlation exists within the system, and is possible with external systems. (Author)

AD-273 697 Div. 25
(TISTP/WH) OTS price $2.60

Weizmann Inst. (Israel).
EFFECT OF A PERIODIC POTENTIAL ON A DEGENERATE FERMI GAS,
by S. Moszkowski and L. Wilets. 18 Jan 62, 23p. 5 refs. (Technical note no. 14)
(Contract AF 61(052)337)
(AFOSR-2390) Unclassified report

DESCRIPTORS: (*Electrons, Gases, Potential theory, *Electron transitions, *Nuclear energy levels.) (Nuclei, Statistical analysis.)

The effect of a periodic potential on the particle and energy density of a degenerate Fermi gas is considered. It is found that for a weak and long wavelength potential the inhomogeneity correction (deviation from the Thomas Fermi statistical model) to the kinetic energy density is only 1/9 as large as the Weizsacker estimate. The potential energy density due to Majorana exchange two-body interactions of short range is also given to a high accuracy by the statistical model; the corrections are only 1/9 as large as for a short range Wigner (ordinary) interaction. For the analogous two dimensional Fermi gas, the inhomogeneity corrections vanish at least to high order unless the periodic potential contains short wavelength components. Relevance to the problem of the nuclear surface is discussed. (Author)

AD-273 706 Div. 25
(TISTP/MFA) OTS price $3.60

Microwave Lab., Stanford U., Calif.
INTERACTION EFFECTS BETWEEN A PLASMA AND A VELOCITY-MODULATED ELECTRON BEAM,
by Gabriel F. Freire. Feb 62, 128p. incl. illus. 16 refs. (Scientific rept. no. 38; ML rept. no. 890)
(Contract AF 19(604)1930, Proj. 4619)
(AFCRL 62-82) Unclassified report

DESCRIPTORS: Interactions between *Plasma oscillations and Velocity, Modulation, *Electron beams.) (*Harmonic analysis, Bessel functions, Partial differential equations, Nonlinear systems.) (Cathode ray tubes, Klystrons, Dielectrics.)

The interaction between a grid modulated electron beam of finite diameter and a stationary plasma column, in the absence of a magnetic field, was investigated theoretically and experimentally. Experiments performed with a beam-plasma tube, with modulation of the electron beam by grids, revealed a maximum interaction when the modulation frequency of the beam was equal to or near the plasma frequency of the plasma. An electronic gain of 7.5 db due to the plasma was observed. The output powers were low with no net gain in any condition, due to the low impedances of the cavities which were used, and to the low beam current available. Nevertheless, it was possible, by driving the beam to saturation power levels, to obtain fundamental components of the beam current. Under conditions for existence of growing waves in the system, strong harmonic generation becomes possible as a result of modifications of space-charge forces on the beam, due to the presence of the plasma. Expressions for the second-harmonic components of the relevant rf quantities in the infinite beam-plasma system were derived, indicating the existence of growing second-harmonics. (Author)

AD-273 718 Div. 25
(TISTP/MFA) OTS price $3.60

Naval Ordnance Test Station, China Lake, Calif.
ANALYTICAL VERSIONS OF PENETRATION PROCESSES,
by Werner Goldsmith. Feb 62, 34p. incl. illus. table, 24 refs. (NOTS TP 2811)
(NAVWEPS rept. no. 7812)
Unclassified report

DESCRIPTORS: (*Penetration of *Particles into *Solids, Solid state physics.) (Energy, Wave transmission, Elastic scattering.) (Plasticity, Deformation, Elasticity, *Stresses, Shear stresses, *Phase transitions.) (Hydrodynamics, Jets.) (*Cratering and Impact shock of Meteorites.)

In the interest of obtaining a comprehensive view of the penetration of bodies into solid plates some of the more prominent theoretical relations used to describe penetration processes are outlined and correlated. The velocity ranges to which these relations apply and the assumptions used in the analytical developments are summarized. Elastic behavior processes in impact are first discussed to establish lower bounds on the impact velocity for the formation of a crater. Various analytical representations of crater formation processes are summarized and the advantages of the theory of constant dynamic flow pressure are demonstrated by calculated results which agree well with experimental penetration data from several sources. The hydrodynamic theory of penetration and Opik's theory of penetration are discussed in relation to these conclusions on crater formation. (Author)

AD-273 739 Div. 25
(TISTP/MFA) OTS price $9.10

Little, Arthur D., Inc., Cambridge, Mass.
RESEARCH STUDY OF CRYOPUMPING WITH A RADIATION SHIELDED CONDENSER,
by Raymond W. Moore, Jr. Mar 62, 99p. incl. illus. tables, 12 refs.
(Contract AF 40(600)899, Proj. 7778)
(AEDC TDR 62-57) Unclassified report

DESCRIPTORS: (*Cryogenics, Feasibility studies, *Infrared radiation, *Solar energy, *Refrigerant condensers, Shielding, Vacuum systems, Nitrogen.) (Instrumentation, Measurement, Vacuum pumps, Design, Ionization, Gages.) (Heat transfer, Thermal diffusion, Aluminum.)

This report includes:
National Research Corp., Cambridge, Mass.
INSTRUMENTATION ASSISTANCE TO ARTHUR D. LITTLE, INC. RE: CRYOPUMPING RESEARCH INVESTIGATION.
Summary rept., by John C. Simons, Jr. 14 July 61.
(Subcontract to Little, Arthur D., Inc., Cambridge, Mass., Contract AF 40(600)899)

The purpose of this study was to develop information for the empirical design of a cryopumping array. Experiments with a chevron-shielded condenser have been carried out and, where possible, the results correlated with analysis. An array constructed from aluminum panels proved to be very serviceable. The greatest transmission of radiation through the chevrons to the condenser occurred with a CO2 deposit on the chevrons and a nitrogen deposit on the condenser, and with infrared radiation incident on the inlet to the array. Even under these conditions less than 2 percent of the incident irradiation was transmitted to the condenser. It was concluded that cryopumping by means of a condenser at 20 K, radiation shielded by surfaces cooled to 77 to 100 K, can provide effective means for removal of nitrogen and all less volatile gases from a vacuum space in the ultra-high vacuum range. (Author)

AD-273 740 Div. 25, 8
(TISTP/MFA) OTS price $2.60

Bendix Systems Div., Bendix Corp., Ann Arbor, Mich.
ANTENNA WINDOW: A TECHNIQUE FOR PROPAGATION THROUGH A PLASMA SHEATH.
Interim engineering rept. no. 3, 1 Dec 61-1 Mar 62,
by Robert G. DeLosh. 1 Mar 62, 25p. incl. illus.
(Rept. no. BSR 667)
(Contract AF 33(616)8420)
Unclassified report

DESCRIPTORS: (*Microwave probes, *Plasma physics, *Antennas, Waveguide windows.) (*Reflectometers, Oscillograms, Waveguides, Attenuation.) (Instrumentation, Design under Flight testing.) (Boundary layer, Shock waves, Propagation, Wave transmission.)

A double microwave reflectometer probe was designed and developed for measuring the properties of dense plasmas. It was to measure the properties of plasmas having up to 10 to the 16th power electrons per cc and collision frequencies up to 10 to the 12th power per sec. The system and its theory of operation are discussed. Measurements of the effect of a magnetic field on the transmission and reflection characteristics of a plasma slab were made. The measured values of transmission-loss check well with those predicted from the measured plasma properties and linear theory while the reflection coefficient is a function of power level. A theoretical justification is given for this linear transmission-nonlinear reflection phenomenon. The curves of stagnation point N, Nu and shock stand-off distance given in the Interim Engineering Report 2 (AD-267 934) were extended to a 50 lb Trailblazer II payload. Design of the instrumentation for the forthcoming flight tests was begun. (Author)

AD-273 750 Div. 25, 4
(TISTM/EJH) OTS price $8.10

Varian Associates, Palo Alto, Calif.
RESEARCH STUDY OF CHEMISORPTION BY MAGNETO ABSORPTION.
Rept. for Feb 59-Dec 60 on Research on Interface Phenomena,
by Donald P. Hollis. Jan 62, 78p. incl. illus. tables, 49 refs.
(Contract AF 33(616)6287, Proj. 7022)
(ASD TR 61-138) Unclassified report

DESCRIPTORS: (*Ferromagnetic materials, *Nickel, Particles in Silicon compounds, Dioxides, Single crystals, Surfaces, Iron, *Adsorption of *Hydrogen, Magnetic properties, Ferromagnetism, Spectrographic analysis, Microwave spectroscopy, Radiofrequency, Theory.) Catalysts.

The effect of adsorbed H on the magnetic losses in finely divided Ni at 3.7 and 13 mc/sec. was studied. The increased sensitivity at these frequencies is attributed to a difference in relaxation times for particles of different sizes. Experiments designed to detect the effect of adsorbed H on the microwave absorption of Fe and Ni single crystals are described. Possible

reasons for the lack of a clear-cut effect are discussed. Ferromagnetic resonance spectra of finely divided Ni are described. The effects of adsorbed H on the intensity, g-value and line width of the resonance are discussed. It is demonstrated that the well-known magnetic effects of chemisorbed H on Ni, which have been measured at static and low frequency fields, can be observed also by magnetic resonance and with a sensitivity at least 10 to the 5th power greater, in terms of weight of metal required. (Author)

AD-273 757 Div. 25
(TISTP/MFA) OTS price $2.60

Army Ordnance Missile Command, Redstone Arsenal, Huntsville, Ala.
A GENERAL PROBE THEORY FOR MEASUREMENTS IN A PLASMA,
by Charles M. Cason and T. A. Barr, Jr.
22 Jan 62, 24p. incl. illus. table, 6 refs.
(Rept. no TR 2H4R)
Unclassified report

DESCRIPTORS: (*Plasma physics, Measurement by *Microwave probes, Theory.) (Gas discharges, Electrons, Ions, Transport properties.) (Physical properties, Diffusion, Excitation, Ionization, Temperature, Conductivity.) (Least squares method, Perturbation theory.)

The standard model of floating probes in plasmas is reviewed. It is shown that a maximum charge density exists for the application of this model. An explicit expression of voltage applied to the probes in terms of circuit current is obtained. When certain simplifying assumptions are used, this equation is reduced to the Langmuir single probe equation and the Johnson-Malter double probe equation. From measurements of probe current versus applied probe voltage, electron temperature at each respective probe can be determined. One example is given to illustrate the calculation. (Author)

AD-273 761 Div. 25, 15
(TISTP/MFA) OTS price $1.60

Electronic Defense Labs., Mountain View, Calif.
WAVE PROPAGATION ON LOG-PERIODIC TRANSMISSION LINES,
by William J. Welch. 16 Feb 62, 15p. (Technical memo. no. EDL-M446)
(Contract DA 36-039-sc-87475)
Unclassified report

DESCRIPTORS: (Wave transmission along *Transmission lines, *Antennas.) (Geometry, Functions, Polynomials, Taylor's series, Fourier analysis.) (Electrical properties of Transmission lines, Impedance.)

The propagation of waves along a transmission line, loaded log-periodically with impedance elements, is considered. By definition, the element spacing forms a geometric series, and the element magnitudes are proportional to their respective distances from the input end of the line. It is shown that the over-all effective impedance per unit length and admittance per unit length are represented by logarithmic functions. A general orthogonal series expansion is then found for such functions. Next, the general solution of the transmission line equations is considered for impedance and admittance per unit length. Although the solution for the purely log-periodic line cannot be factored into a simple form, a variational method is presented by means of which it can be approximately solved in terms of logarithmic waves. The variational technique makes use of formulas being stationary with respect to the current and voltage distributions on the line. The distributions are assumed and the stationary property allows one to calculate the valves. (Author)

AD-273 763 Div. 25, 2
(TISTP/TL) OTS price $3.60

Georgia U., Athens.
SPECTROGRAPHIC AND SPECTROMETRIC DATA OF PROJECT FIREFLY 1960, I. SPECTROGRAPHIC STUDIES OF THE FORMATION OF MOLECULAR COMPLEXES BETWEEN THE RARE GASES AND ELEMENTS WHICH HAVE LOW-LYING METASTABLE STATES, II. A RECORDING INTERFEROMETER FOR DETERMINING THE TEMPERATURE OF CESIUM CLOUDS RELEASED IN THE UPPER ATMOSPHERE BY MEASURING SPECTRAL LINE WIDTHS, III.
Final rept.,
by C. Dewey Cooper. 30 Dec 61, 35p. incl. illus. tables, 14 refs.
(Contract AF 19(604)6163)
(AFCRL 62-258) Unclassified report

DESCRIPTORS: (*Spectrographic analysis, Molecular spectroscopy, Rare gases and Elements.) (Spectrographic data, Recording devices, *Interferometers, Temperatures, Measurement.) (*Sodium and *Cesium, *Clouds in the *Upper atmosphere.)

AD-273 777 Div. 25, 17
(TISTM/GEC) OTS price $3.60

Carnegie Inst. of Tech., Pittsburgh, Pa.
ON THE CORROSION OF SINGLE CRYSTALS, BICRYSTALS AND POLYCRYSTALS OF AN AUSTENITIC STAINLESS STEEL IN BOILING NITRIC ACID,
by R. D. Leggett and H. W. Paxton. 23 Feb 62, 30p. incl. illus. tables, 39 refs.
(Contract Nonr-76014, Proj. NR 036-029)
Unclassified report

DESCRIPTORS: (*Stainless steel, Austenite, *Crystals, *Single crystals, *Metallic crystals, *Corrosion research.) (Tests, *Corrosion with Boiling, Nitric acid, Metallurgical analysis, Microstructure, Grains (Metallurgy), Heat treatment.) Alloys.

Single crystals, bicrystals and polycrystals of 20%Cr-20%Ni austenitic stainless steel were corroded in boiling nitric acid. The weight loss was independent of crystallographic orientation, grain size, and heat treatment. Metallographic observations showed no correlation between weight loss and microstructure. Adding 5 g/liter of Cr(6+), which is known to accelerate rates by one to two orders of magnitude, did not change the above conclusions. No significant change in the corrosion rates and morphologies occurred for single and bicrystals, even for those of high carbon (0.06%) and high nitrogen (0.24%) content, after aging under conditions which normally produce marked sensitization in polycrystalline samples. The morphology of attack was a complex combination of pitting and grain boundary attack dependent on thermal history and grain misorientation, but these effects were not reflected in the over-all corrosion rate unless grain dropping occurred. (Author)

AD-273 784 Div. 25
(TISTP/MFA) OTS price $2.60

Electronic Defense Labs., Mountain View, Calif.
RANGE AND AZIMUTH DETERMINATION OF VLF ENERGY,
by Charles A. Marsh. 12 Feb 62, 19p. incl. illus. 20 refs. (Technical memo. no. EDL-M364)
(Contract DA 36-039-sc-87475)
Unclassified report

DESCRIPTORS: (Wave transmission of *Very low frequency, Energy between Earth and *Ionosphere, *Atmospherics.) (*Radio ranges and *Azimuth of Radiofrequency oscillations, Radiofrequency spectrum analyzers.) (Waveguides, Antennas, Radio receivers, Oscilloscopes, Delay lines, Radiofrequency amplifiers.) (Errors, Mathematical prediction.)

A general theory to explain the propagation characteristics of very low frequency (VLF) waves which travel between the earth and the ionosphere is presented. From this theory, two methods for range determination are suggested by analyzing the received energy spectrum. The magnitude and the cause of the errors which can be expected in both range and azimuth measurements are predicted. (Author)

AD-273 793 Div. 25
(TISTP/MFA) OTS price $2.60

Sheffield U. (Gt. Brit.).
ELECTRON CORRELATION IN METALS.
Annual summary rept. no. 2, 1 Nov 60-31 Oct 61,
by N. H. March and S. Sampanthar. 31 Oct 61, 24p. incl. illus. 16 refs.
(Contract AF 61(052)317)
(ARL-230) Unclassified report

DESCRIPTORS: (*Electrons, Density in *Metals and *Gases.) (Wave analysis, *Quantum mechanics, Nuclear spins, Atomic orbitals, Lattices, Theory.)

Results for the diagonal element of the second-order density matrix (pair function) and for the momentum distribution of an interacting electron gas are presented. In the low density limit, it is shown that, to a similar degree of approximation, the first-order density matrix and hence the momentum distribution may be obtained. In the high-density problem, the pair function has also been calculated using the Green's function approach. From the information available in these high and low density limits, the range of usefulness of the concept of the Fermi surface in an interacting electron gas is discussed. Also, results of variational calculations on the stability of Overhauser spin-density waves in metals are reported. It is concluded that such waves reduce the energy below the Hartree-Fock value only when the interaction becomes very strong, or equivalently when the density is very low. Some preliminary work on the correlation problem in a non-uniform electron gas is also briefly discussed. (Author)

AD-273 797 Div. 25, 15
(TISTP/WH) OTS price $8.60

Brown U., Providence, R. I.
AN INVESTIGATION OF THE ENERGY CRITERION IN SNAP BUCKLING PROBLEMS WITH APPLICATION TO CLAMPED ARCHES,
by A. Gjelsvik and S. R. Bodner. Feb 62, 63p. illus. tables, 19 refs.
(Technical rept. no. 28)
(Contract Nonr-56220, Proj. NR-064-424)
Unclassified report

DESCRIPTORS: (*Structures, *Structural shells, Deformation, *Buckling, Failure (Mechanics).) (*Stresses, Mathematical analysis, Differential equations.)

A critical analysis is presented of the significance of the energy criterion for systems that exhibit snap buckling. The results of energetic analyses are compared to solutions of the differential equations for the nonlinear behavior of a clamped low arch subjected to a central concentrated load. The differential equation analyses include consideration of transitional non-symmetrical buckling modes. The snap buckling of low arches in the presence of high temperature creep is also considered. Experiments are described on the deformation of such arches under static and creep conditions. (Author)

AD-273 799 Div. 25, 4, 30
(TISTM/GEC) OTS price $5.60

Research Inst., Temple U., Philadelphia, Pa.
PLASMA JET CHEMISTRY.
Annual rept. no. 1,
by A. V. Grosse, H. W. Leutner, and C. S. Stokes. 31 Dec 61, 34p. illus. 4 refs.
(Contract Nonr-308502)
Unclassified report

DESCRIPTORS: (*Plasma jets, Radiofrequency, Design for use in Synthesis of Cyanogen, Hydrocyanic acids, Acetylenes and Nitrogen compounds, Oxides, *Chemical reactions, Reduction of Aluminum compounds, Oxides.)

Two types of plasma jets were built and used: a dc high intensity plasma jet and a radiofrequency plasma jet. A detailed description of the devices, their operating conditions and characteristics are presented. Detailed descriptions are given of the preparation of several gaseous endothermic compounds with the plasma jet, such as (CN)2, HCN, acetylene, and the oxides of N. Various methods of preparation of these compounds are reported. The use of the plasma jet as a reducing device for oxides was tested with Al2O3. Although the investigations were not completed, the results of the first experiments are included. (Author)

AD-273 830 Div. 25
(TISTP/MFA) OTS price $5.60

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
PRODUCTION OF A PLASMA WITH HIGH-LEVEL PULSED MICROWAVE POWER,
by Thomas J. Fessenden. 29 Aug 61, 51p. incl. illus. table, 28 refs. (Technical rept. no. 389)
(Contract DA 36-039-sc-78108, Proj. 3-99-00-000)
Unclassified report

DESCRIPTORS: (*Plasma physics, Measurement by *Cavity resonators, Microwave equipment, *Radiofrequency power, *Microwave probes.) (Ferrites, Magnetrons, Klystrons, Oscillograms, Frequency modulation, Quartz resonators, Waveguides.) (Analysis, Perturbation theory, Electrons, Density.)

A method is presented for producing a dense plasma in a resonant cavity with microwave energy. The plasma is contained in a quartz tube lying along the axis of a resonant cavity that is excited near the TE111 coaxial-mode resonance with 10-microsec pulses of up to 800 kw of peak power in the 10-cm band. The plasma serves as a center conductor for the coaxial mode, shifting

the mode resonance near the exciting frequency. The initial transient in the plasma electron density occurs very rapidly, and the system appears to reach a steady state in less than 10-microsec. A second microwave system excites the cavity in the TE011 coaxial mode, which is used as a low-level probe to measure the properties of the plasma. A perturbation formula is developed that can be used to calculate the perturbing effects of the dense plasma. This formula is used to develop methods of calculating the electron density and collision frequency of the plasma by measurements of the detuning of the cavity mode. Plasma electron densities of over 10 to the 14th power per cc are measured when over 80 kw of peak power are dissipated in the discharge. Studies are also presented of helium discharges and of light generated by the discharges. (Author)

AD-273 832 Div. 25
(TISTM/BRW) OTS price $.50

Massachusetts Inst. of Tech., Cambridge.
ELASTIC-PLASTIC DEFORMATION OF A SINGLE GROOVED FLAT PLATE UNDER LONGITUDINAL SHEAR.
Rept. for Sep 59-Sep 61, on Metallic Materials, by Michael F. Koskinen. Dec 61, 15p. incl. illus. 7 refs.
(Contract AF 18(600)957, Proj. 7351)
(ASD TR 61-63) Unclassified report

DESCRIPTORS: (*Fatigue (Mechanics), Solids, *Elasticity, *Plasticity, *Deformation, *Sheets, Stresses, Shear stresses, Load distribution, Mathematical analysis, Equations.)

The development of the plastic strain in a V-grooved flat plate under longitudinal shear was followed from the elastic through the partially plastic to the fully plastic condition for a non-strainhardening material. The region of plastic flow develops monotonically. Adjacent to the zone of deformation in the fully plastic case there is a region where limited plastic deformation has occurred. The results for the growth of the plastic zone were compared with predictions based on the elastic-plastic solution for an infinite plate and the elastic solution for a finite plate. Agreement is good at low stress levels. At high stress levels, a relatively simple empirical equation, satisfying over-all equilibrium, is proposed. Predictions based on elasticity theory alone are shown to be seriously in error. (Author)

AD-273 842 Div. 25, 15
(TISTP/MFA) OTS price $2.60

RAND Corp., Santa Monica, Calif.
THE ANALYTIC SIGNAL REPRESENTATION OF MODULATED WAVEFORMS,
by Edward Bedrosian. Mar 62, 19p. incl. illus. 17 refs. (Memo. no. RM-3080-PR)
(Contract AF 49(638)700, Proj. RAND)
Unclassified report

DESCRIPTORS: (*Sidebands, Amplitude modulation, Communications theory, Radio signals, *Phase modulation.) (*Signal generators, *Radio-frequency, Wave analysis.) (Fourier analysis, Integral transforms, Sequential analysis, Functions.)

A general and mathematically convenient formulation of analog-modulated signals which makes use of the analytic signal concept is presented. Known types of modulation are readily identified as special cases. As a result of examining the various cases which the model embraces, a new type of modulation has been discovered--single sideband frequency modulation (SSB FM)--which can be derived from a conventional phase-modulated signal by an additional amplitude modulation, using the exponential function of the modulating signal's Hilbert transform. The resulting modulated signal will have a one-sided spectrum about the carrier frequency, will be compatible with existing FM receivers, and will cause a decrease in signal bandwidth. (Author)

AD-273 845 Div. 25, 8
(TISTM/BRW) OTS price $1.60

David Sarnoff Research Center, Princeton, N. J.
HIGH TEMPERATURE SEMICONDUCTOR RESEARCH.
Scientific rept. no. 8, 1 Oct-31 Dec 61, by J. Blanc, R. H. Bube and others. 31 Jan 62, 13p. incl. illus. tables, refs.
(Contract AF 19(604)6152, Proj. 4608)
(AFCRL 62-53) Unclassified report

DESCRIPTORS: (High temperature research, *Semiconductors, *Gallium compounds, *Arsenides, *Phosphides, Intermetallic compounds.) (Crystals, Growth, Crystallization, Pressure, Electrical properties, Resistance.) (Transport properties, Arsenic, Vapors, Chemical impurities, Carbon.)

The explosions in the high pressure magnetic Czochralski apparatus for the growth of GaP were eliminated. In repeated tests, boules of GaP were prepared without difficulty. Thermally stimulated current measurements of high resistivity GaAs after annealing at 700 C in molten KCN for 16 hr have verified that the concentration of traps in GaAs prepared by the horizontal Bridgman technique are distinctly lower than in GaAs prepared by the floating zone technique. The rate of cooling of GaAs crystals subsequent to growth has a marked effect on their electrical properties. Rapidly cooled crystals tend to be high resistivity. Because of wide discrepancies in measurements reported in the literature, accurate measurements of the temperature variation of the dissociation pressure are being carried out using a quartz Bourdon gauge. Experiments were carried out indicating that C can be transported during the sublimation of As by both mechanical and chemical means. This, together with other evidence, makes it plausible that the black deposit observed remaining behind after multiple sublimations of spectrographically pure As is carbon. (Author)

AD-273 851 Div. 25
(TISTP/WH) OTS price $11.00

Tennessee U., Knoxville.
THE INFRARED SPECTRUM OF HYDROGEN FLUORIDE: LINE POSITIONS AND LINE SHAPES,
by W. F. Herget, N. M. Gailar and A. H. Nielsen. 1 Mar 62, 134p. incl. illus. tables, 18 refs.
(Scientific rept. no. 1)
(Contract AF 19(604)7981, Proj. 7670)
(AFCRL-62-253)
Unlassified report

DESCRIPTORS: (Absorption of *Infrared radiation by Gases.) (*Fluorides, Hydrogen compounds.) (Infrared spectroscopy, Pressure, Electron transitions.) Theses.

The true shape of the rotational absorption lines of the hydrogen fluoride fundamental band was investigated. The line shapes were to be measured at pressures where pressure broadening made the only significant contribution to the true line shape. The experimental aspects of this investigation are discussed. All data were taken with the vacuum-grating spectrograph recently completed at the University of Tennessee. The results of the line center and line shape measurements are presented. Twenty-one fundamental and seventeen first overtone line centers were measured at low pressure with an estimated accuracy of ± 1/0.02 cm. The fundamental and first overtone band centers were calculated to be 1/3961.43 cm and 1/7750.83 cm, respectively. The results of this investigation and suggestions for future experiments in this field are presented. (Author)

AD-273 854 Div. 25
(TISTP/TL) OTS price $3.60

Aerospace Information Div., Washington, D. C.
PERSONALITIES AND ORGANIZATIONS ACTIVE IN SOVIET MASER AND LASER RESEARCH (PRELIMINARY).
5 Jan 62, 28p. (AID rept. no. 62-19)
Unclassified report

DESCRIPTORS: (*Bibliography of *Scientific personnel active in USSR, Maser, *Scientific research.) Quantum mechanics, Radio waves, Physics.) Semiconductors, Organic materials.

Contents:
Infrared and optical masers
Semiconductor devices
Gaseous discharge masers
Paramagnetic systems
Organic maser materials
Beam masers
Maser systems
Background research
Maser applications

AD-273 866 Div. 25
(TISTP/MFA) OTS price $4.60

Airborne Instruments Lab., Inc., Mineola, N. Y.
TUNABLE MASER DEVELOPMENT.
Final engineering rept. on Phase I, 1 Apr 60-30 Nov 61,
by F. Arams and B. Peyton. 30 Nov 61, 32p. incl. illus. tables, 9 refs. (Rept. no. 8431-2)
Unclassified report

DESCRIPTORS: (*Tests and Design of *Masers by *Tuned amplifiers.) (Analysis by *Low temperature research, Materials of Crystals, *Oxides, *Titanium compounds with Chromium, Thin films.) (Waveguides, Ferrites, Dielectrics, Ferromagnetic materials.)

Low-temperature experiments combined with theoretical analysis were carried out to provide data for the selection of (1) the most suitable maser material and pumping techniques, (2) the best angular orientations of the crystal consistent with pump frequency and applied magnetic field requirements, (3) a low-loss traveling-wave structure that is capable of being operated over a large frequency range, and (4) ferrite isolators that will contribute sufficient reverse loss to increase stable operation of the TWM amplifier. (Author)

AD-273 878 Div. 25
(TISTP/WH) OTS price $16.00

Palmer Physical Lab., Princeton U., N. J.
MICROWAVE ATOMIC OSCILLATOR USING THE HYPERFINE TRANSITION OF Rb87.
Final rept., 1 Oct 57-30 Sep 60 on Investigations of the Effect of Gas Collisions and Optical Pumping on the Breadth of Spectral Lines. Optical Detection Phase,
by C. O. Alley. 30 Sep 60, 1v. incl. illus. tables, 117 refs.
(Contract DA 36-039-sc-70147)
Unclassified report

DESCRIPTORS: (*Microwave oscillators, Atoms, Electron transitions, *Hyperfine structure.) (Nuclear magnetic moments, Nuclear magnetic resonance.) (Vapors of *Rubidium, Isotopes.) (Relaxation time, Glass, Coatings.)

A new method of optical detection of the $m_F = 0 \leftrightarrow m_F = 0$, $\Delta F = 1$ ground state magnetic hyperfine transition in alkali atoms, which is important for atomic frequency standards because of its first order independence of an external magnetic field, was investigated. After orientation by optical pumping, a quantum mechanical superposition state is produced by a 90 deg rf pulse. A phase change between $m_F = 0$ state and its partner states of the same F value is caused by a microwave field at ~ 6835 Mc coupling the two $m_F = 0$ states. This phase change is converted into a population change by a second rf pulse to yield a large change in the resonance scattering of the optical pumping light, on the order of that obtained by reversal of the orientation of the vapor. Other methods of optical detection of this resonance were studied. Wall coatings for the inhibition of spin relaxation in confined oriented vapors were studied experimentally. (Author)

AD-273 883 Div. 25
(TISTP/WH) OTS price $1.60

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
THE NATURE OF THE MOTION OF A GYROSCOPE IN THE PRESENCE OF DISPLACED CENTER OF GRAVITY AND FRICTION,
by S. I. Makarikhin. 28 Feb 62, 17p. incl. illus. 13 refs. (Trans. no. FTD-TT-62-189 of Izvestiya Vysshikh Uchebnykh Zavedeniy, Priborostroyeniye 4:No.6, pp. 97-108, 1961)
Unclassified report

DESCRIPTORS: (*Gyroscopes, Equations of Motion.) USSR.

The effect is studied of a displaced center of gravity in a gyroscopic system in the presence of friction and correction momenta upon the motion of a gyroscope with a horizontal external axis. The problem is solved using the concept of the mapping point. The effects of displaced center of gravity, correction and fluid friction on the motion of a gyroscope with a constant correction characteristic when the cantilever is fixed are examined. (Author)

AD-273 884 Div. 25, 8
(TISTP/MFA) OTS price $1.60

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
HIGH-FREQUENCY OSCILLATIONS IN A LOW-PRESSURE

DISCHARGE,
by I. A. Savchenko and A. A. Zaytsev. 28 Feb 62, 9p. incl. illus. 17 refs. (Trans. no. FTD-TT-62-116 of Vestnik Moscovskogo Universiteta No. 2, pp. 19-25, 1961)
Unclassified report

DESCRIPTORS: (*High frequency, *Plasma oscillations of Electrons, Low pressure research in *Gas discharges.) (*Electron beams, Scattering, Excitation.) (*Discharge tubes, Cathodes, Amplifiers, Electrodes, Oscilloscope probes, Radio receivers.) USSR.

Electron plasma oscillations were investigated. The plasma was generated and controlled by an electron beam. The results of the investigation show that the character of the observable oscillations severely vary on the plasma boundaries. (Author)

AD-273 885 Div. 25, 7
(TISTP/MFA) OTS price $1.60

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
THE EQUATIONS OF A MAGNETOHYDRODYNAMIC ALTERNATING-CURRENT GENERATOR HAVING A ROTATING MAGNETIC FIELD,
by Ye. I. Yantovskiy. 16 Feb 62, 20p. incl. illus. 14 refs. (Trans. no. FTD-TT-62-90 of Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, Energetika i Avtomatika, No. 6, pp. 142-151, 1961)
Unclassified report

DESCRIPTORS: (*Magnetohydrodynamics, *Generators, Electromagnetic fields in Rotation.) (*Electrical equipment, Electric motors, Turbines, *Gas turbine rotors.) (Hydrodynamics of Equations, Motion, Partial differential equations.) USSR.

The development of power-station engineering is the direct conversion of energy from gas flow into electrical energy in the form of alternating current in an electrodeless MHD generator with a rotating magnetic field. Alternating current from this generator can have a very high voltage, which makes it possible to dispense with step-up transformers. The power of the generator is not limited by structure, but is determined by the delivery of the working body, and can be tens of millions of kilowatts per unit. The schematics of generators with a rotating motor are described. (Author)

AD-273 889 Div. 25
(TISTP/MFA) OTS price $1.60

AeroChem Research Labs., Inc., Princeton, N. J.
SUMMARY OF LOW TEMPERATURE PLASMA-JET RESEARCH. ENERGY TRANSPORT IN CHEMICALLY ACTIVE NONEQUILIBRIUM SUPERSONIC STREAMS.
Final rept.,
by Daniel E. Rosner. Feb 62, 11p. (Technical pub. no. 39)
(Contract AF 49(638)300)
(AFOSR-2202)
Unclassified report

DESCRIPTORS: (*Low temperature research on *Plasma jets.) (Research program administration, *Abstracting of Scientific research related to Experimental data and Theory of Energy, *Transport properties and Ionization of *Gas flow.) Bibliography.

The abstracts of 17 reports and papers are given together with a chronological listing of 18 verbal presentations made under the same contract. These contributions deal with experimental and theoretical aspects of energy transport in chemically active, nonequilibrium gaseous streams and represent the results of a 4 year program of research in this area. (Author)

26. PRODUCTION AND MANAGEMENT

AD-273 450 Div. 26, 17, 14
(TISTM/BRW) OTS price $8.60

Martin Marietta Corp., Baltimore, Md.
MANUFACTURING METHODS AND DESIGN PROCEDURES OF BRAZED REFRACTORY METAL HONEYCOMB SANDWICH PANELS.
Interim technical documentary progress rept., 20 Nov 61-20 Feb 62,
by James W. McCown, C. Wilks and others.
20 Feb 62, 94p. incl. illus. tables, 44 refs.
(Contract AF 33(657)7276)
(ASD TDR 62-937) Unclassified report

DESCRIPTORS: (*Sandwich panels, Manufacturing methods, Design, *Brazing, Honeycomb cores, Refractory materials, Metals, *Molybdenum alloys, *Niobium alloys, Titanium alloys, Zirconium alloys.) (Refractory coatings, Sandwich construction, Oxidation inhibitors, Heat, Shielding, Spaceships, Satellite vehicles, Thermal insulation.) (High temperature research, Soldering alloys, Vacuum furnaces, Tests, Test equipment, Tools.) (Honeycomb cores, Electron beams, Welding.) (Sheets, Foils, Processing, Mechanical properties.)

Honeycomb sandwich panels using Mo and Nb core and facings can be brazed to provide lightweight structural coverings for high temperature application on an aerospace vehicle. The panel configurations selected for fabrication simulate a hot structural and a radiant heat shield application. TZM (Mo-0.5Ti-0.08Zr) Mo and D-36 (Nb-10Ti-5Zr) Nb alloys were chosen for use on the program. Special tools and procedures were developed to fabricate the honeycomb core. All Mo welding will be accomplished by electron beam welding. A 4200 F cold-wall vacuum furnace will be used to braze the honeycomb test panels. A quartz-lamp facility will be used to heat the panels for structural testing. Thermal-cyclic and sonic fatigue tests will be performed on heat shield test panels. A 4000 F cold-wall vacuum test chamber will be used to determine material and honeycomb properties. (Author)

AD-273 477 Div. 26, 17
(TISTM/GEC) OTS price $14.00

Budd Co., Philadelphia, Pa.
DEVELOPMENT OF AUTOMATIC QUALITY CONTROL FOR RESISTANCE WELDS IN ALUMINUM ALLOYS. PHASE I A STUDY OF THE CHANGE IN WELD ZONE RESISTANCE IN SPOT WELDING ALUMINUM ALLOYS,
by Richard P. Hurlebaus. 20 Feb 62, 128p. illus. 21 refs.
(Contract DA 36-034-ORD-3217)
Unclassified report

DESCRIPTORS: (Alloys, *Aluminum alloys (2024, 2014, 7075, 5052, 5086), Welding, *Spot welding, *Electric welding, Resistance, Manufacturing methods, Automation for Quality control.) (Effect of Electrodes, Growth, Time, Thickness, Electric currents on Electrical properties, Resistance of Spot welds.) Tables.

The study of resistance spot welding of several commercial Al alloys using 3 phase power supply showed a correlation between the weld zone resistances and the weld nugget development. A 3-phase frequency converter spot welding machine with pulse counting timihg was used. Spot weld tests on 0.020 in. 2024, 2014, 7075, 5052, and 0.025 in. 5086, and 0.050 in. 2024, 2014, 7075, 5086, and 5456 alloys with recognized welding schedules were made to study the resistance-time characteristics of each material. The electrode tip voltage and weld current were selected and measured for each weld. Weld tests showed the weld nugget was formed after one or two pulses of weld current. The weld zone resistance-time graphs showed the resistances decreased continuously during weld time. The effect of welding variables on the weld zone resistance and weld size was the main objective. The weld time affected the final resistance to a greater extent than the reference resistance for a given weld schedule. The longer weld times produced a lower final resistance. (Author)

AD-273 517 Div. 26, 14, 17, 27
(TISTM/TCG) OTS price $3.60

Rocketdyne, Canoga Park, Calif.
MANDRELS FOR FILAMENT WINDING.
Interim technical engineering rept. no. 2, 9 Nov 61-9 Feb 62,
by M. Varlas. Feb 62, 38p. incl. illus. tables.
(Rept. no. R-3338-2)
(Contract AF 33(600)43594)
(ASD TR 7-880a, vol. 2) Unclassified report

DESCRIPTORS: (*Manufacturing methods, Processing, *Filament wound construction, Materials, Design, Casting, Test methods, Wire winding machines.) (Water, Solubility, Sand, Silicon compounds, Calcium compounds, Oxides, Inorganic substances, Carbohydrates.) (Metals, Aluminum, Structures.) (Heat treatment, Deformation, Stresses, Mechanical properties, Physical properties.) Pressure vessels, Rocket cases.

A summary is given of laboratory and small-scale mandrel evaluations performed as part of Phase II investigations. Several mandrel materials and concepts are being evaluated in light of several parameters. Mandrel material properties and the effects of winding and curing operations on these materials during the fabrication of a filament-wound structure are discussed. Status of current small-scale mandrel investigations and the projected plan of action are presented. Laboratory and small-scale mandrel evaluations show that Navmold (carbohydrate-based material) mandrel material has comparatively good shrinkage and thermal expansion properties. But, as noted for other hot-melt, water-soluble materials in the literature survey of Phase I, radial deformation due to the winding and curing operation was excessive. (Author)

AD-273 532 Div. 26, 17, 1, 12
(TISTM/GEC) OTS price $16.50

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
FLAT HIGH STRENGTH STEEL SHEET APPLICABLE FOR USE IN THE AIRCRAFT AND MISSILE INDUSTRY.
Rept. on Phase II for 1 Feb 60-31 Jan 62,
by T. H. McCunn and B. Sack. 28 Feb 62, 237p. incl. illus. tables.
(Contract AF 33(600)40312)
(ASD TR-7-780) Unclassified report

DESCRIPTORS: (Alloys, *Steel (A-286, AM-350, Potomac Type 422, Altemp R-41), *Sheets for Airframes.) (Manufacturing methods, Processing, Melting, Heat treatment, Rolling mills, *Precision finishing, Welding, *Thickness, Gages, Quality control.) Tables.

Production of 36 and 48 in wide sheet of air frame structural materials to 1/4 of AISI thickness tolerances was undertaken. Coils of A-286, AM-350, Potomac A, Type 422, and Altemp R-41 were processed to finish thicknesses of 0.010, 0.030, 0.080, and 0.100 in. Coils were gaged at hot roll, intermediate, and finish thicknesses. Although all coils were not within the required thickness range, it was demonstrated that all materials with the possible exception of Altemp R-41 could be produced to 1/4 AISI thickness tolerance on the available equipment. The most important factor affecting crown at finish gage was the percent crown at hot roll thickness. During cold rolling to thicknesses as thin as 0.017 in, the average percent crown was generally unchanged or only slightly affected. End-to-end variation of continuous hot rolled coils was generally superior to that of welded coils. Rolling and cracking of the weld metal could lead to excessive thickness variation. Coils at 0.010 in finish thickness were more difficult to produce and welded coils presented more problems than continuous hot rolled coils. (Author)

AD-273 542 Div. 26, 17
(TISTM/BRW) OTS price $3.60

Crucible Steel Co. of America, Midland, Pa.
THE DEVELOPMENT OF OPTIMUM MANUFACTURING METHODS FOR COLUMBIUM ALLOY FORGINGS.
Interim technical engineering rept., 16 Aug-15 Nov 61,
by R. O. Carson. Dec 61, 31p. incl. illus. tables.
(Contract AF 33(600)39944, Proj. 7-782)
(ASD TR 7-782, vol. 6) Unclassified report

DESCRIPTORS: (Manufacturing methods, *Forging, *Niobium alloys (Cb74), Tungsten alloys, Zirconium alloys, Casting, Extrusion.) (Processing, Powder alloys, Powder metallurgy, Melting, Electron beams, Electric arcs, Vacuum furnaces, Sheets.) Test methods, Tensile properties, Stresses, Rupture, Alloys.

Four-inch-diameter Cb74 (Nb-10W-4Zr) vacuum arc melted ingots were cast and extruded to 2-in.-diameter forging stock. The ingots and the extrusions were of good quality. Side forging of one of these cast ingots was not successful. (Author)

AD-273 543 Div. 26, 17
(TISTM/BRW) OTS price $4.60

Crucible Steel Co. of America, Midland, Pa.
THE DEVELOPMENT OF OPTIMUM MANUFACTURING METHODS FOR COLUMBIUM ALLOY FORGINGS.
Interim technical engineering rept., 15 Nov 61-15 Feb 62,
by P. F. Darby. Feb 61, 36p. incl. illus. tables.
(Contract AF 33(600)39944, Proj. 7-782)
(ASD TR 7-782, vol. 7) Unclassified report

Division 26 - PRODUCTION AND MANAGEMENT

DESCRIPTORS: (Manufacturing methods, *Forging, *Niobium alloys (Cb74), Tungsten alloys, Zirconium alloys, Temperature, Dies, Refractory coatings, Oxidation inhibitors, Aluminum compounds, Chromium compounds, Silicon coatings.) (Extrusion, Heat treatment, Deformation.) (High temperature research, Tensile properties, Stresses, Rupture.) Nondestructive testing, Ultrasonics, Crystal structures, Hardness, Crystallization, Microstructure, Surface properties.

Sixteen Cb74 (10W-4Zr) closed die forgings were made from 16 forging blanks with conventional forging equipment and techniques. No perceptible die wear resuted with a 2400F forging temperature while considerable die wear occurred when a 2200F forging temperature was used. Excellent oxidation protection was provided by the Al-Cr-Si coating. Variation in the thickness of this coating is believed to have caused the slightly rough surface on several forgings. Open die side forging of extruded and annealed Cb74 to a smaller round produced center bursts. This defect was not encountered when the stock was swaged or flattened. The high temperature tensile and stress rupture strengths of the 4% Zr closed die forgings were equivalent to that reported for 6% Zr Cb74 upsets. Room temperature and -40F tensile ductility was excellent in the longitudinal direction but the transverse room temperature ductility was low. Oxidation resistance of the 4% Zr Cb74 was the same as the 6% Zr alloy in the 2000 to 2400 F range but was superior in the 1500 to 1823 F range. (Author)

AD-273 618 Div. 26, 8
(TISTE/NTM) OTS price $1.60

Diamond Ordnance Fuze Labs., Washington, D. C.
PHOTOENGRAVING PROCEDURES FOR SILICON DEVICE FABRICATION,
by C. H. Klute, G. B. Wetzel and others.
23 Feb 62, 24p. incl. illus. 5 refs. (DOFL rept. no. TR-1019)
(Proj. DA-5N06-01-014)
Unclassified report

DESCRIPTORS: (*Photoengraving, Processing, Production, *Manufacturing methods, Solid state physics, Electronic equipment, Transistors, Silicon.) Semiconductors, Materials, Resistance, Test methods, Tests.

Photoengraving procedures are especially adaptable to the fabrication of solid-state electronic devices from silicon because they provide a convenient method for using the naturally occurring oxide layer to control the areas into which impurities can be diffused. A precision printer has been devised to register the so-called step-and-repeat transparencies, used in the photoengraving process, with appropriate areas of the silicon surface. By means of this device and selective etchants, it is possible to remove the oxide layer or to make shallow or comparatively deep etches into silicon over small and accurately specified areas. Examples of the results achieved thereby are discussed as they relate to silicon device fabrication. (Author)

AD-273 648 Div. 26, 17
(TISTM/TCG) OTS price $.50

Rock Island Arsenal Lab., Ill.
DEPOSITION OF ALLOYS BY CHEMICAL REDUCTION,
by Jacob Knanishu. 4 Dec 61, 15p. 15 refs.
(Rept. no. 61-4359)
(Proj. 593-32-006)
Unclassified report

DESCRIPTORS: (*Plating, *Chromium plating, *Nickel plating without Electrodes, *Metal coatings, Deposits of Nickel alloys, Cobalt alloys, Chromium alloys, Iron alloys on Steel, Magnesium, Aluminum by Chemical reactions, Reduction.) (Stannates, Coatings on Magnesium.) Alloys, Metals.

A literature survey was made on electroless plating and a historical report on its development is given. The deposition of alloys of Ni, Co, and alloy combinations of Ni, Cr and Fe were explored, the basis metal being steel, Al or Mg. Co and Ni were successfully plated on steel and Al, as was the plating of Ni on Mg. Stannate coating of Mg was also undertaken with success. (Author)

AD-273 653 Div. 26
(TISTP/WH) OTS price $2.60

Applied Mathematics and Statistics Labs., Stanford U., Calif.
ACCOMMODATION OF SECOND-CLASS TRAFFIC,
by Donald P. Gaver, Jr. 26 Feb 62, 28p. 4 refs.
(Technical rept. no. 74)
(Contract Nonr-22552, Proj. NR 342-022)
Unclassified report

DESCRIPTORS: (Operations research, *Scheduling, *Traffic.) Statistical analysis.

AD-273 859 Div. 26
(TISTM/BRW) OTS price $6.60

General Electric Co., Cincinnati, Ohio.
LOW VISCOSITY BEARING STABILITY INVESTIGATION FOR THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.
Quarterly project status rept. no. 1, for period ending 9 Feb 62.
9 Feb 62, 62p. incl. illus. table, 16 ref.
Unclassified report

DESCRIPTORS: (*Bearings, Space environmental conditions, Liquid metals, Potassium, Lubricants, Viscosity, Design.) (Test equipment, Design.)

A combined analytical and experimental effort was begun to select and develop bearing configurations which promise stable operation up to the high speeds typical of space turbomachinery (35,000 rpm). Main emphasis is placed on experimental investigations and evaluation. The experimental tool is an especially designed high speed test rig, precision made for interchangeability of a large variety of bearing configurations and rotors. It is equipped with the most refined instrumentation to record rotor and bearing motions, as well as other parameters affecting bearing operation. The testing will be carried out at close to room temperature with lubricants which simulate the low viscosity and lubricity of liquid metals at operating temperatures. The experimental program will be supplemented by analytical studies necessary to select the most promising bearing configurations, and to reduce test results to dimensionless parameters, permitting generalization of the information obtained. (Author)

27. PROPULSION SYSTEMS

AD-273 573 Div. 27, 14
(TISTM/EJH) OTS price $9.10

Ammunition Group, Picatinny Arsenal, Dover, N. J.
PRODUCTION ENGINEERING OF METAL AND OTHER INERT PARTS FOR M30 ROCKET MOTOR FOR NIKE HERCULES MISSILE.
Final engineering rept.,
by Harold Mannheimer. Dec 61, 101p. incl. illus. tables, 10 refs. (Technical rept. no. DC-TR: 5-61)
(Proj. PA-11-3D1)
Unclassified report

DESCRIPTORS: (*Rocket motors, *Rocket cases, Hydrostatic pressure, Test methods, Thermal insulation, Materials, Coatings, Corrosion inhibition, Combustion chamber liners, Organic solvents, Low temperature research, High pressure research.) (Asbestos fiber, Phenolic resins, Refractory coatings.) (Guided missiles, Surface to air.)

It was recommended that the hydrostatic test time requirement be reduced to the time required for the hydrostatic pressure to stabilize at 900 psi. Of the blast tube insulating materials tested with a small scale rocket motor, an asbestos-phenolic material was chosen for full scale testing. Various organic solvents including methylene chloride, and chloroform indicated there would be no difficulty in removing the polysulfide rubber liner; this would allow the reclaiming of metal parts after static firing. Susceptibility of metal motor parts to corrosion was determined and a number of refractory coatings were found protective. Tests were conducted on a loaded motor in low temperature environment to determine the rate of grain temperature change and the time that the rocket can be exposed to extreme temperatures without falling below the specified firing or storage temperature limits.

AD-273 666 Div. 27
(TISTB/CCH) OTS price $2.60

Aerospace Medical Div., Wright Air Development Div., Wright-Patterson Air Force Base, Ohio.
FAR FIELD NOISE AND VIBRATION LEVELS PRODUCED DURING THE SATURN SA-1 LAUNCH.
Preliminary rept.,
by J. N. Cole and C. E. Thomas. Dec 61, 22p. incl. illus.
(Projs. 7321 and 1309)
(ASD TR 61-607) Unclassified report

DESCRIPTORS: (*Booster rockets, Launching, Noise, *Acoustics, Measurement, Frequency.) (*Sound, Vibration, Pressure.)

Acoustic measurements were made of the sound pressure level-time functions which were produced at six locations on Cape Canaveral Missile Test Annex and at four locations in the surrounding communities during the Saturn SA-1 launch on 27 October 1961. The frequency range of measured data was from the 4.7 to 9.4 cps octave band to the 4800 to 9600 cps octave band. Distances from the launch site to the noise measuring sites ranged from 3700 to 100,000 feet. Vibration data were taken at three locations at the Tel-2 telemetry site. The frequency range of measured data was from the 4.5 to 9 cps octave band to the 1125 to 2250 cps octave band. The distance from the launch site was 5200 feet. Only the basic sound pressure level-time environments and vibration level-time environments as a function of octave bands of frequency are presented in this report. (Author)

AD-273 774 Div. 27, 14
(TISTM/GEC) OTS price $1.60

Atlantic Research Corp., Alexandria, Va.
IMPROVEMENT OF THE USEFULNESS OF PYROLYTIC GRAPHITE IN ROCKET MOTOR APPLICATIONS.
Quarterly progress rept., Dec 61-Feb 62,
by J. D. Batchelor, E. F. Ford and others.
20 Mar 62, 14p. incl. illus. tables.
(Contract DA 36-034-ORD-3279)
Unclassified report

DESCRIPTORS: (Solid rocket propellants, *Rocket motor nozzles, *Graphite, Coatings, Refractory coatings, Carbon deposits, Processing, Manufacturing methods.) (Tests, Combustion, Erosion, Physical properties, Microstructure.)

Tests of coated nozzles were made to measure the inherent serviceability of pyrolytic graphite under severe conditions using an advanced propellant of 6500 F flame temperature. Deposition runs, in which pyrolytic graphite was formed at a low temperature (1340 C) on tubular substrates of three different grades, showed significant differences in the microstructure of the coating. The deposit on a relatively non-graphitic substrate had a finer microstructure than that on the standard graphite substrate. The coating on a high-purity, coarse-grained graphite had a coarser structure. Steam pretreatment of the substrate produced an increase in the cone size in pyrolytic graphite which was probably caused by increased activity of local sites on the substrate surface. Pyrolytic graphite nozzles were tested in three rocket motor firings to define the effect of motor pressure on the erosion rate of the standard (2000 C) coating. A fourth motor test indicated that a lower temperature coating (1700 C) was not serviceable with the 6500 F propellant. (Author)

AD-273 794 Div. 27, 26
(TISTA/VGW) OTS price $4.60

6593d Test Group (Dev) Air Force Systems Command, Edwards Air Force Base, Calif.
FACILITIES AVAILABILITY AND REQUIREMENTS FOR FABRICATION OF CASE SEGMENTS AND CLOSURES FOR LARGE SOLID PROPELLANT ROCKET MOTORS,
by Wilbur C. Andrepont, Stewart W. Turner and James C. Thompson. Sep 61, 39p. incl. illus. tables.
(SSD TR 61-44) Unclassified report

DESCRIPTORS: (Rocket motors, Solid rocket propellants, *Rocket cases, *Couplings, Rings, Preparation, Processing, Production, Drawing (Machine processing), Forging, Explosive forming, Welding, Machining, Effectiveness of *Industrial production, Research program administration.)

An investigation is reported of current industry capability for fabricating case segments and closures for large segmented solid propellant rocket motors. The capability of industry to fabricate cylindrical case segments using roll and weld technique, machined ring forging and power shear spinning is presented. For closure fabrication, the capability of industry to fabricate closures by spinning, explosive forming and welding is presented. Because of the limited technology currently available with more advanced fabrication techniques such as strip lap, fiberglas winding and cryogenic stretch forming, these processes could not be considered for immediate use on a large motor development program. The current capabilities of industry are further broken down to cover available vertical lathes,

horizontal lathes, heat treat facilities, expandable mandrels, forged ring facilities, power shear spinning, welding, roll formers and flat plate production. Tables are presented which summarize the availability and requirements of facilities, cost and lead time to obtain the capability for four motor diameters: 100, 136, 156 and 200 inches diameter. (Author)

AD-273 826 Div. 27, 26, 17
(TISTM/EJH) OTS price $2.60

Lyon Inc., Detroit, Mich.
DEVELOPMENT OF DEEP DRAWN - ONE PIECE HIGH PERFORMANCE ROCKET MOTOR CASE.
General rept. no. 15, 10 Dec 61-10 Jan 62,
by Wayne A. Martin. 10 Jan 62, 25p. incl. illus.
(Contract DA 20-018-ORD-23004)
Unclassified report

DESCRIPTORS: (Solid rocket propellants, *Rocket motors, *Rocket cases, Manufacturing methods, Drawing (Machine processing), Heat treatment, Machine tools, Dies.) (Metals, Alloys, *Steel, *Titanium alloys, Nickel alloys, Processing, Hardening, Microstructure.)

AD-273 836 Div. 27
(TISTA/LSK) OTS price $5.60

Jet Propulsion Center, Purdue U., Lafayette, Ind.
INVESTIGATION OF A GAS-DRIVEN JET PUMP FOR ROCKET ENGINES.
Final rept.,
by D. L. Crabtree. Jan 62, 45p. incl. illus. table, 8 refs. (Rept. no. F-62-1)
(Contract Nonr-110007)
Unclassified report

DESCRIPTORS: (*Jet pumps, *Fuel pumps, Liquid rocket propellants, Fluid flow in Fuel systems, Rocket motors, Combustion chambers, Configuration, Design, Effectiveness.) (Gas generating systems, Gas flow.)

Investigations of the gas-driven jet pump revealed no fundamental thermodynamical or fluid mechanical reason which would preclude the pumping of a net flow rate of a liquid to a discharge pressure in excess of the nozzle pressure. Gas-consumption between 5.0 and 10.0% should be attainable for these pumps in which the momentum recovery factor of each component is about 0.9. The gas-driven jet pump does not appear applicable to pumping cryogenic propellants or propellants with uncommonly high vapor pressures. The operating characteristics of this pump are strongly influenced by the shape and mechanical design of its components. The velocity recovery factor of the drive nozzle is limited to a value below 0.9 for a drive nozzle employing an injector having a differential pressure of injection which is compatible with the system requirements. Condensibility of the drive gas in the drive liquid is an impediment to the attainment of a high velocity for the 2-phase mixture leaving the drive nozzle. It is possible to mix the drive liquid with the suction liquid, in the mixer, and achieve a momentum recovery in excess of 90%. The volume of the entrained drive gas in the 2-phase mixture entering a properly designed centrifugal separator could be reduced by 95% in flowing through that separator. (Author)

AD-273 871 Div. 27, 10
(TISTA/LSK) OTS price $3.60

Lockheed Propulsion Co., Redlands, Calif.
FEASIBILITY DEMONSTRATION OF LARGE SEGMENTED SOLID PROPELLANT ROCKET MOTOR WITH DUAL TVC SYSTEM AND THERMAL GRAIN STRUCTURAL ANALYSIS,
by J. Scott Coverdale and John Jones. 22 Mar 62, 26p. incl. illus. 3 refs. (LPC rept. no. 557 and 578-TN-1, vol. 2)
(Contract AF 04(611)8013)
(AFBMD TN 62-1)
Unclassified report

DESCRIPTORS: (*Solid rocket propellants, Bonding to Rocket cases of *Rocket motors.) (Propellant grains, Elasticity, Plasticity, Viscosity, Stresses, Thermal stresses, Thermodynamics, Temperature, Failure (Mechanics), Tests, Test methods.)

Studies were conducted to determine the effects of cyclic temperatures in producing failures in case-bonded solid propellant grains. During this report period an extensive uniaxial experimental program was scheduled for the determination of thermal effects on propellants. A collection of limit elastic solutions for case-bonded grains subjected to thermal inputs was completed and the problem of determining suitably expressed temperature distributions in grains was studied. The problem of transient temperature cycling of uniaxial samples was examined. (Author)

AD-273 887 Div. 27, 10
(TISTA/SEB) OTS price $36.00

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
THEORETICAL BASES FOR THE DESIGN OF LIQUID-FUELED ROCKET ENGINES,
by M. I. Shevelyuk. 7 Mar 62, 953p. incl. illus. tables, 52 refs. (Trans. no. MCL-1358 of Gosudarstvennoye Nauchno-Tekhnicheskoye Izdatel'stvo Oborongiz, Moskva, pp. 1-684, 1960)
Unclassified report

DESCRIPTORS: (*Rocket motors, Pressure, Heat transfer, Cooling, Fuel systems, Combustion chambers, Design, Thrust, Combustion, Gas flow, Combustion chamber gases, Theory, Mathematical analysis, Reliability.) (Rocket motor nozzles, Design.) (Exhaust gases, Gas flow.) (*Liquid rocket propellants, Rocket fuels, Rocket oxidizers, Thermodynamics, Propellant properties.) (Gas turbines, Gas generating systems.) (Fuel injectors, Fuel nozzles, Fuel sprays.) Instruction manuals.

Theoretical foundations of the design of liquid-fueled rocket engines are given using data published in the foreign literature as a basis. The operating modes, working processes, and characteristics of the liquid-fueled rocket engine and its chamber, the planning and design of atomizing devices and systems for delivering fuel into the chamber, as well as the specifications of the fuels used are discussed. The book also illuminates the problems of chamber cooling and operation and testing of liquid-fueled rocket engine. The volume is designed as a study aid for the higher technical schools in the corresponding specialties: it can also be used as a textbook for engineers and technicians in this field. (Author)

28. PSYCHOLOGY AND HUMAN ENGINEERING

AD-273 460 Div. 28
(TISTB/AW) OTS price $2.00

National Aeronautics and Space Administration, Washington, D. C.
HUMAN PILOTS' DYNAMIC-RESPONSE CHARACTERISTICS MEASURED IN FLIGHT AND ON A NONMOVING SIMULATOR,
by Helmut A. Kuehnel. Mar 62, 73p. incl. illus. tables, 10 refs. (Technical note D-1229)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1229.

DESCRIPTORS: (*Pilots, *Behavior, Measurement, Flight instruments, Control systems, Cockpits.) (Dynamics, Motor reactions, Reaction (Psychology).) Mathematical computer data.

An investigation was made in flight and on a nonmoving simulator to determine the dynamic-response characteristics of human pilots controlling the longitudinal response of an airplane subject to random-appearing disturbances. Data are presented in the form of the pilots' frequency response and the power spectral density of error and pilot output. Results indicate that the character of the pilot's frequency response is influenced by the type of input disturbance, by the type of visual error display, and to a lesser extent by the flight conditions or dynamics of the controlled element. A brief investigation was made to determine the airplane-response quantity of most importance to the pilot in a tracking task with a pitch-attitude-error indicator. The results indicate that the pilot's control behavior is dependent primarily on the pitch response of the airplane and is not influenced by the normal-acceleration response. (Author)

AD-273 574 Div. 28
(TISTB/AW) OTS price $3.60

Engineering Psychology Lab., U. of Pittsburgh, Pa.
FACILITATION OF SIGNAL DETECTION BY THE USE OF ARTIFICIAL SIGNALS AND BY THE USE OF LONGER VIEWING TIME,
by Richard A. Regan. Oct 61, 30p. incl. illus. tables, 14 refs. (Technical rept. no. 3) (Contract Nonr-62411)
Unclassified report

DESCRIPTORS: (*Attention, Visual signals, Detection.) (Fatigue (Physiology), Time.)

The effectiveness of the observing response technique in improving signal detection efficiency was demonstrated in two experiments. In the first experiment, the percentage of detections proved greater than Mackworth had found earlier with continuous viewing, and even greater than Holland had found in his study. Fourteen subjects in this experiment showed no decline in observing rate as their signal detections decreased. Increasing the rate of signal presentation by the addition of frequent, distinguishable, artificial signals during the final hour of the session eliminated the temporal decrement shown by 13 subjects in the first hour of the experiment; their response rate increased throughout most of a two-hour session. In the second experiment, the use of an illumination period of 1.0 second reduced the frequency of observing response and apparently prevented any decrement in signal detection in the second half-hour as was seen in the first experiment where the observation period was limited to 0.07 seconds. (Author)

AD-273 640 Div. 28
(TISTB/AW) OTS price $4.60

Behavioral Sciences Lab., Aerospace Medical Div., Wright-Patterson Air Force Base, Ohio.
BIBLIOGRAPHY ON MEMORY.
Rept. for period ending 1961,
by J. David Barcik. Mar 62, 44p. (MRL memo. no. P-1)
Unclassified report

DESCRIPTORS: (*Bibliography, *Memory.) *Learning.

29. QUARTERMASTER EQUIPMENT AND SUPPLIES

AD-273 722 Div. 29
(TISTB/AW) OTS price $3.60

Ammunition Group, Picatinny Arsenal, Dover, N. J.
EVALUATION OF MASK, ANTIFLASH, ROCKET LAUNCHER, M19A1,
by Elbert Huselton and Paul Schindler. Mar 62, 36p. incl. illus. tables, 2 refs. (Technical rept. no. DC-TR: 1-4-62)
Unclassified report

DESCRIPTORS: (*Protective clothing, *Goggles, Rocket launchers, Safety devices.)

Two series of 3.5 Inch Rocket firings at -20 F. were run to observe the effect of rocket blowback on the M19A1 Antiflash Mask. In the first series, the mask was mounted six inches aft of the launcher bell-mouth. In the second series, the mask was mounted in a position corresponding to the gunner's head. The firings showed that the M19A1 Antiflash Mask provided adequate protection against 3.5 Inch Rocket blowback. The M19 Antiflash Mask, tested in the first series for comparison purposes, was badly damaged. Study of the new (M19A1) mask indicated need for human engineering. (Author)

AD-273 876 Div. 29
(TISTB/LH) OTS price $10.50

Office of the Director of Defense Research and Engineering, Washington, D. C.
SYMPOSIUM ON PERSONNEL ARMOR HELD AT THE U. S. NAVAL RESEARCH LABORATORY OCTOBER 4-5, 1961.
VOLUME I.
1961, 135p. incl. illus. tables.
Unclassified report

DESCRIPTORS: (*Symposia, *Body armor, Protective clothing.) Textiles, Laminates, Physical properties, Shock resistance.

Contents:
Characterization of textile yarns for use under ballistic impact conditions

Dynamic behavior of textile fibers and structures as related to personnel armor
A theoretical study of penetration and residual projectile velocities
Method for obtaining yield stresses at high strain rates
The dynamic properties of high tenacity yarns and their relationship to ballistic resistance
Buoyant insulating body armors from staple fibers
Some U. S. Army Research Office sponsored research
Development of QMC composite armor vest
The effect of resin concentration on physical properties of a laminated structure for a crash and ballistic protective flight helmet
A set of angles of obliquity for use in assessing body armor

AD-273 890 Div. 29
(TISTB/LH) OTS price $7.60

Behavioral Sciences Lab., Aerospace Medical Div., Wright-Patterson Air Force Base, Ohio.
PERSONNEL EQUIPMENT DATA: CONCEPT AND CONTENT.
Rept. on Training, Personnel, and Psychological Aspects of Bioastronautics,
by Sidney Gael and Lawrence E. Reed. Dec 61, 74p. incl. illus. tables, 3 refs.
(Proj. 1710)
(ASD TR 61-739) Unclassified report

DESCRIPTORS: (*Data, *Standards, Specifications, Handbooks.) (*Military equipment, *Air force equipment, *Air force supplies, Standardization, Military requirements, Production, Control, Management engineering.)

An investigation is made of Personnel-Equipment Data on one of the personnel subsystem elements to identify requirements contained in military specifications and related documents which can generate unnecessary duplicative effort. Eighteen documents deemed relevant to the study were scrutinized, and requirements calling for the submittal of data were extracted. A list of these requirements and their locations is presented. Duplication tending to bring about redundant work effort was less than anticipated, but sufficient to provoke concern. A few sources of unnecessary duplication of effort are discussed, and suggestions which can help eliminate duplication are presented. (Author)

30. RESEARCH AND RESEARCH EQUIPMENT

AD-273 498 Div. 30, 20
(TISTP/TL) OTS price $13.00

General Dynamics/Fort Worth, Tex.
SHIELD PENETRATION PROGRAMS C-17 AND L-63,
by D. M. Peterson. 29 Dec 61, 191p. incl. illus. tables, 16 refs. (ANP Doc. no. NARF-61-39T; Rept. no. FZK-9-170)
(Contract AF 33(600)38946)
Unclassified report

DESCRIPTORS: (*Digital computers, *Programming of *Shielding, Penetration of *Gamma ray, *Neutron spectrum from Leakage of *Research reactors.)

Two programs are described which have been coded for the IBM-704 (and are compatible with the IBM-7090). The programs calculate the neutron and/or gamma spectra, heat generation rate, and/or dose rate at each of a group of point detectors, due to each of a group of point sources. The sources may be divided into sets, with each set having unique source spectra. In addition to the above calculation, the spectrum, heating rate, and/or dose rate for each detector, summed over each source-point set and over the entire source group may be computed. The two programs are similar, both computationally, and as regards input and output information, excepting for the complexity of the problem geometries acceptable to the programs. (Author)

AD-273 508 Div. 30
(TISTP/WH) OTS price $1.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
DIVISION 5. INFORMATION PROCESSING.
Quarterly progress rept., 1 Dec 61-28 Feb 62, 15 Mar 62, 12p. incl. table, 5 refs.
(Contract AF 19(604)7400)
(AFESD TDR 62-67) Unclassified report

DESCRIPTORS: (*Data processing systems, *Digital computers, *Computers, Memory devices, Circuits, Analog-to-digital converters, Design, Magnetic materials, Films.) (Psychology, *Speech, Automatic, Speech representation.) Mathematical analysis.

AD-273 520 Div. 30, 28, 15
(TISTP/MFA) OTS price $5.60

Scope, Inc., Falls Church, Va.
DEVELOPMENT OF AN ADVANCED CONDITIONED REFLEX MODEL.
Quarterly progress rept. no. 1, 1 Nov 61-20 Feb 62.
20 Feb 62, 44p. incl. illus. tables, 4 refs.
(Contract AF 33(657)7509, Proj. 4040)
Unclassified report

DESCRIPTORS: (Feasibility studies of *Conditioned reflex, *Memory devices, Feedback, Control systems, Design.) (*Mathematical logic, Sequences, Coding, Programming, Switching circuits.) (*Statistical analysis, Probability, Sampling, Statistical distributions, *Information theory.)

The design and construction of an advanced laboratory conditioned-reflex model is described to demonstrate the feasibility of a conditioned-reflex system for ECM automatic mode selection. The organization of the model consists of a sensory field connected to a discrimination field which, in turn, is connected to several memory planes. Each memory plane is assigned to a class of inputs and a response is evoked by correlating the stored information with input information. This report reviews the theory and organization of the system. (Author)

AD-273 527 Div. 30, 9
(TISTA/WAW) OTS price $5.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
INITIAL AERODYNAMIC CALIBRATION RESULTS FOR THE AEDC-PWT 16-FT SUPERSONIC TUNNEL,
by J. H. Nichols, M. W. Davis, and C. L. Garner, Jr. Mar 62, 45p. incl. illus. 4 refs.
(Rept. no. AEDC TDR 62-55)
(Contract AF 40(600)800)
Unclassified report

DESCRIPTORS: (*Supersonic wind tunnels, Wind tunnels and Wind tunnel nozzles, Aerodynamics, Supersonics, Calibration, Pressure, Errors, Mach number, Measurement.) Humidity.

Initial aerodynamic calibration of the testing region of the PWT 16-Ft Supersonic Tunnel consisted of surveys of a 20-foot length of nozzle and test section in which the most desirable model locations occur. These surveys were obtained with an eight-foot traversing rake utilizing pitot-wedge and pitot-temperature probes. The data included isentropic-nozzle Mach number distributions both on and off the centerline, true local Mach number determined from the pitot-wedge probes, nozzle pressure recovery, and flow misalignment. These surveys were conducted at nozzle Mach numbers of 1.50, 1.60, 1.75, 2.00, 2.25, 2.50, 2.75, 3.00, 3.25, and 3.50. Results show that maximum Mach number variations over the surveyed length are ±0.02. The stagnation pressure recovery through the nozzle, for the range of specific humidity obtained during this program, varied from 0.993 to 0.961 at nozzle contour numbers from 1.50 to 3.50. (Author)

AD-273 528 Div. 30
(TISTA/LSK) OTS price $5.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
PERFORMANCE OF A TWO-STAGE LAUNCHER USING HYDROGEN,
by W. B. Stephenson and R. E. Knapp. Mar 62, 50p. incl. illus. tables, 15 refs.
(Rept. no. AEDC TDR 62-32)
(Contract AF 40(600)800)
Unclassified report

DESCRIPTORS: (Projectiles, Hypervelocity projectiles, Launching, Velocity using Hydrogen, Propellants in *Hypervelocity guns.) (Interior ballistics, Velocity, Determination, Mathematical analysis by Computers.) (Hydrogen, Thermodynamics.)

A procedure is outlined for computing the performance of two-stage, light-gas launchers using hydrogen as a propellant. A method in general dimensionless terms is developed by which the launch velocity for this type of launcher may be computed. The effects of piston weight and velocity, as well as preheating of the pump tube gas, are determined. Experimental results using both unheated and heated hydrogen are compared with theoretical calculations of velocity. Since the important physical variables -- piston mass, velocity, pump tube geometry, initial pump tube pressure, piston reversal, initial projectile movement, and heat losses -- are included, a design optimization has been made, and limits to the launch velocity were estimated. (Author)

AD-273 545 Div. 30, 6
(TISTW/DLW) OTS price $19.75

Tasker Instruments Corp., Van Nuys, Calif.
DEVELOPMENT OF EQUIPMENT FOR TRANSITION/TERMINAL AREA SUBSYSTEM OF THE AIR TRAFFIC CONTROL DATA PROCESSING CENTRAL.
Final rept.
Jan 62, 291p. incl. illus. tables (Rept. no. R 502-1)
(Contract FAA/BRD-318)
Unclassified report

DESCRIPTORS: (*Air traffic control systems, *Data processing systems, *Analog computers, Programming, Video networks, Display systems, Radar equipment, Control systems, Design.) (*Air control centers, Airport radar systems, Automatic, Radar tracking, Radio beacons, Radar signals, Video signals, Computers, Electronic circuits, Electronic equipment, Instrumentation.)

A video tracking system is described which receives primarly radar and beacon data, data inputs from the transition data processing group, and command inputs from the controller. Radar and beacon data are processed by the video conditioner. Data inputs are stored by the video track programmer and command inputs are stored either by the video track programmer or in associated circuitry. These types of data, along with information which is internally generated by the video tracking systems are used to track aircraft automatically and provide surveillance and control information for the control of air traffic within the transition terminal area. Inputs from the transition data processing group are also utilized in presenting a tabular display of the identity and time to fly of the next 5 aircraft to land, by means of electromechanical alpha-numeric indicators which are mounted at the local controller's console and at the precision approach radar console. (Author)

AD-273 569 Div. 30, 9, 1
(TISTA/WAW) OTS price $1.25

National Aeronautics and Space Administration, Washington, D. C.
A RIGIDLY FORCED OSCILLATION SYSTEM FOR MEASURING DYNAMIC-STABILITY PARAMETERS IN TRANSONIC AND SUPERSONIC WIND TUNNELS,
by Albert L. Braslow, Harleth G. Wiley and Cullen Q. Lee. Mar 62, 42p. incl. illus. 10 refs. (Technical Note D-1231; supersedes NACA Research Memorandum L58A28, AD-156 891)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1231.

DESCRIPTORS: (*Transonic wind tunnels, *Supersonic wind tunnels, Wind tunnels, Wind tunnel models, Instrumentation, Oscillation.) (Aerodynamic configurations, Stability (Longitudinal), Stability (Lateral), Damping, Stability, Test methods.) (*Vibration mechanisms by Hydraulic systems, Design, Tests.) (Wing-body configurations, Swept-back wings, Transonics, Aerodynamics, Model tests.) (Balances, Experimental data, Mathematical analysis, Errors.)

The mechanical and electrical details of a sting-mounted, rigidly forced, single-degree-of-freedom, oscillating yaw mechanism is described. The equipment was designed for use in transonic and supersonic wind tunnels. Dynamic-stability parameters measured with the equipment are uninfluenced by airstream turbulence or buffeting. Aerodynamically unstable bodies do not cause the mechanism to diverge, and configurations with negative damping can be tested. The accuracy of the system was investigated by application of known eddy-current damping moments. Typical wind-tunnel results are presented for the damping in yaw and oscillatory directional stability of a simplified airplane model with 45 degrees sweptback wing and vertical tail at transonic speeds. (Author)

AD-273 607 Div. 30
(TISTP/WH) OTS price $4.60

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
A HIGH-SPEED, SOLID-STATE, DIGITAL SCANNER FOR

USE WITH THE ERA 1102 COMPUTER,
by G. R. Mozer and J. H. Brewer. Mar 62, 42p. incl. illus. (Rept. no. AEDC TDR 62-61)
(Contract AF 40(600)800)
Unclassified report

DESCRIPTORS: (*Digital computers, Solid state physics, Data processing systems, *Electronic scanners, Electronic equipment, Supersonic wind tunnels.)

A high-speed, solid-state, digital scanner for entering data into the raw data system of the ERA 1102 computer is described. It was built for the Propulsion Wind Tunnel's 16-Ft superior tunnel. The system capabilities, design considerations, theory of operation, and fabrication techniques are discussed. (Author)

AD-273 655 Div. 30, 25
(TISTA/WAW) OTS price $4.60

Research Labs. for the Engineering Sciences, U. of Virginia, Charlottesville.
AN ELECTROMAGNETIC SUSPENSION SYSTEM FOR THE MEASUREMENT OF AERODYNAMIC CHARACTERISTICS,
by H. M. Parker, J. E. May, and G. S. Nurre. Mar 62, 40p. incl. illus. 13 refs. (Rept. no. AST-4433-106-62U)
(Contract AF 49(638)1022, Proj. 9783)
(AFOSR-2294) Unclassified report

DESCRIPTORS: (*Wind tunnels, Instrumentation, *Balances by Magnetic fields, Design, Mathematical analysis, Differential equations, Vector analysis, Calibration.) (Spheres, Drag, Model tests, Wind tunnel models.)

The design concepts are presented for a free electromagnetic suspension system functioning as force balance yielding simultaneous and independent measurements of force in three mutually perpendicular directions. The system is adapted to function as a wind tunnel balance which requires no physical attachment to the model under study. The concepts have been reduced to practice in a first-generation balance which is to be applied to the study of low-density sphere drags as a first demonstration of the unique capabilities of this balance system. The first model also is intended to serve as a test device to provide design information for a second-generation balance for the study of dynamic stability. The apparatus is described in detail and calibration procedures and future applications are discussed. (Author)

AD-273 669 Div. 30
(TISTP/MFA) OTS price $3.60

Air Force Cambridge Research Labs., Bedford, Mass.
ANALOG-TO-DIGITAL DATA REDUCTION SYSTEM,
by J. E. Reegan. Jan 62, 27p. incl. illus. tables. (Rept. no. AFCRL 62-16)
Unclassified report

DESCRIPTORS: (*Analog-to-digital converters, *Digital computers, *Data processing systems, Recording devices, Coding, Programming, Punched card methods, Magnetic tape.) (Neon, Switching circuits, Triggered gates.)

Described herein is a new method of recording and processing large amounts of propagation and signal strength data on perforated tape by means of an automatic analog-to-digital conversion and time recording system, with data reduction and curve plots performed by a biquinary computer. A digital voltmeter and digital clock sample the input data, identify the data as a function of time, and store it digitally. For propagation tests, the analog input is sampled at a one-second rate. The information stored in the converter is read out in a biquinary digital code on punched tape and processed by a biquinary computer. Specific numerical values for each one-second sample can be presented on a flexowriter. The computer automatically determines the mean values, computed at one-minute intervals and feeds these mean values through an X - Y variplotter associated with the computer where a distribution curve is automatically plotted. This data reduction system, although of special value in radio propagation research, may also be used wherever amplitude is plotted vs. time. (Author)

AD-273 690 Div. 30, 26, 25
(TISTM/EJH) OTS price $5.60

Electro-Optical Systems, Inc., Pasadena, Calif.
DEVELOPMENT OF LIGHTWEIGHT OPTICALLY ACCURATE REPLICA MIRRORS.
Quarterly progress rept., 27 Nov 61-27 Feb 62,
by D. E. Stewart. 15 Mar 62, 49p. incl. illus. tables, 9 refs. (EOS rept. no. 2110-Q-1)
(Contract DA 44-009-eng-4873, Proj. DEFENDER)
Unclassified report

DESCRIPTORS: (Optics, *Mirrors, *Reflectors, Manufacturing methods, Electroforming, Surfaces, Coatings, Metal coatings, Rhodium, Thin films, Films, Feasibility studies.) (Electroplating, Plating, Nickel plating.) Optical materials.

It was demonstrated that thin rigidized, electroformed, replicas of at least 3 in diameter can be made with surface accuracies sufficient to satisfy the objectives of this contract. Problems in electroforming over vacuum deposited conductive coatings were solved. Criteria for bath temperature and current density control was determined and implemented. The stress phenomena and stress measurement instruments were analyzed. Stress measurement was standardized. Replica thickness variation studies are providing the basic design information required for more accurate replication to be accomplished. Rh coating tests resulted in standardized procedures for Rh plating replicas. (Author)

AD-273 719 Div. 30, 25
(TISTP/MFA) OTS price $6.60

Naval Research Lab., Washington, D. C.
AN X-RAY DIFFRACTION DATA REDUCTION PROGRAM FOR THE IBM 704 AND 7090.
Interim rept.,
by H. G. Norment. 16 Feb 62, 62p. incl. illus. tables, 11 refs. (NRL rept. no. 5739)
Unclassified report

DESCRIPTORS: (*Single crystals, *X-ray diffraction analysis, Crystal structure, Goniometers.) (*Data processing systems, Computers, *Programming, Punched card methods.) (Cameras, Photographs by Reflection.) (Errors, Analysis.)

This program is intended to provide a completely automatic process for reducing raw single-crystal x-ray diffraction intensity data to the form of structure factors. If desired, the data reduction may be extended to yield normalized structure factors. The program is applicable primarily to data obtained on film with Weissenberg

and/or procession goniometers. All programming was done in IBM 704 FORTRAN II language. Binary program decks are available which are independent of any special operating system. The printed output has been contrived to be easy to read and to give the program user easy access to all information necessary for further stages of the structure analysis. Also all information required for correction of the initial set of processed data are provided. The program detects some errors in intensity estimates and indexing, and indicates these both in a preliminary error-detection run and in the final output. The magnetic tape output is consistent with the input of useful structure determination and refinement programs. (Author)

AD-273 735 Div. 30, 8, 25
(TISTP/GRW) OTS price $9.10

International Business Machines Corp., Poughkeepsie, N. Y.
PROJECT LIGHTNING.
Final summary rept. and Quarterly progress rept. no. 10, vol. 1, 1 Mar-31 May 61.
31 July 61, 103p. incl. refs.
(Contract NObsr-77508)
Unclassified report

DESCRIPTORS: (*Cryogenics, Mathematical logic, Computers, *Data processing systems, Thin films.) (*Switching circuits, Electronic circuits, Superconductors, Trigger circuits.) (Thermal conductivity, Measurement, Materials.) (*Memory devices, Design.)

Contents:
Cryogenics
Physical characterization of components
Associated circuit problems
Cryogenic device fabrication
Physical chemistry of thin films
Machine organization
Organizational features of superconductor systems
Cryotron high-speed memory systems
Functional unit analysis
Mechanization of design and analysis
Summary of progress in cryotronic technology and devices
Summary of progress in cryogenic machine organization

AD-273 736 Div. 30, 8, 25
(TISTP/GRW) OTS price $21.00

International Business Machines Corp., Poughkeepsie, N. Y.
PROJECT LIGHTNING.
Quarterly progress rept. no. 10, vol. 2, Technical Appendixes, 1 Mar-31 May 61.
31 July 61, 383p. incl. illus. tables, refs.
(Contract NObsr-77508)
Unclassified report

DESCRIPTORS: (*Cryogenics, *Data processing systems, Thin films of Tin and Indium, Circuits, Superconductors.) (*Switching circuits, *Memory devices, Materials, Design, Mathematical logic.)

General results are presented on the characteristics of tin and indium cryotrons evaporated in conventional evaporators with no special techniques such as substrate heating or prenucleation. Indium from the conventional system is compared with films from more elaborate systems. Indium from the conventional system compared favorably with that produced in an ultra-high vacuum system. Reproducibility results for four in-line cryotrons on one substrate indicate that the cryotrons cannot be interconnected with a sufficient margin of safety on the bias or overdrive on the control when maximum operating speed is desired. The critical currents for a number of tin and indium films are plotted as a function of the ratio of film thickness to penetration depth. The gain characteristics of unity crossing crossed-film cryotrons are discussed. (Author)

AD-273 741 Div. 30
(TISTE/CDM) OTS price $4.60

Montana State Coll., Bozeman.
LINEAR RECURRENT BINARY ERROR-BURST-CODER.
Final rept.,
by Richard W. Weeks, William L. Kilmer and others. 23 Oct 61, 37p. incl. illus.
(Contract AF 30(602)2315)
(RADC TR 61-159) Unclassified report

DESCRIPTORS: (Communication systems, Data transmission systems, *Digital systems, *Linear systems, *Coding, Sequences, Computer logic, Test methods, Tests, Operation.) (Digital computers, Errors, Corrections.)

The construction and testing of a binary error-burst-correcting channel simulator and decoder are discribed. The equipment was constructed from standard binary logic units. The channel simulator (encoder) is not general owing to the linearity of the code and the chosen message sequence of all zeros. It can generate random errors and parity check digits, open the channel gate during a burst and close it during a guard space, and preserve all phase relations. The decoder can compare information digits with parity digits, establish a correction sequence and locate its largest axis, and correct the digits which are in error. The testing procedure uses 2 electronic counters in conjunction with encoder-decoder. One is used to count errors entering the decoder; the other to count those leaving the decoder. Thus, the error correcting efficiency is easily calculated. Test results show perfect correction with a guard space of 132 digits. With guard lengths below 132, better correction efficiency is achieved if the probability of an error during a burst is high. An analytical interpretation of test data is given. (Author)

AD-273 748 Div. 30, 8, 25
(TISTP/GRW) OTS price $5.60

Remington Rand Univac Div., Sperry Corp., St. Paul, Minn.
PROJECT LIGHTNING. VOLUME I.
Quarterly progress rept. no. 5, vol. 1, 1 June-31 Aug 61 on Phase 3.
31 Aug 61, 49p. incl. illus. tables (Rept. no. PX 1599-5, vol. 1)
(Contract NObsr-77521)
Unclassified report

DESCRIPTORS: (*Data processing systems, *Digital computers, Design, Films.) (*Memory devices, *Magnetic tape, Computer logic.) (Thin films, Ferromagnetic materials, Design.) (Electronic circuits, Amplifiers, Transistors.)

Contents:
Search memory
JDU clocking
Power supply system for the JDU
Packaging
JDU logic module test
Film spot output signal
Input-output equipment for the LTM
Philadelphia progress report

AD-273 749 Div. 30, 8, 25
(TISTP/GRW) OTS price $6.60

Remington Rand Univac Div., Sperry Rand Corp., St. Paul, Minn.
PROJECT LIGHTNING. VOLUME II.
Quarterly progress rept. no. 5, vol. 2, 1 June-31 Aug 61 on Phase 3.
31 Aug 61, 57p. incl. illus. tables (Rept. no. PX 1599-5, vol. 2)
(Contract NObsr-77521)
Unclassified report

DESCRIPTORS: (Data processing systems, Data storage systems, Computer logic, *Digital computers, *Memory devices, *Magnetic cores, *Magnetic tape, Ferromagnetic materials.) (Manufacturing methods, Processing, Magnetic tapes, Electrodeposition, Metallic smoke deposits, *Thin films, Glass, Metals.)

Contents:
Film core program
Film deposition techniques
Apparatus and instrumentation
Film property measurements
Switching and resonance studies
Applications
Mathematics and logic research
Improved general-purpose logic array
Majority-logic comparator
Majority-minority conversion theorem
Lightning test machine
High-speed memory stack design
Sense amplifier
High-level word translation
Film strips
Reproducibility of electroplated thin films

AD-273 759 Div. 30
(TISTP/JW) OTS price $2.60

Air Force Cambridge Research Labs., Bedford, Mass.
USE OF A LIST-PROCESSING LANGUAGE IN PROGRAMMING SIMPLIFICATION PROCEDURES,
by S. R. Petrick. Jan 62, 19p. 13 refs. (AFCRL 62-19)
(Proj. no. 4641)
Unclassified report

DESCRIPTORS: (Programming, *Computer logic, Coding, *Language, Machines.) Switching circuits.

A list-processing computer programming language is valuable for the coding of such logical algorithms as arise in truth function simplification because of ease of coding, improved use of computer storage, and a reduction of limitations on the number of variables that can be handled. The effectiveness of an algorithm implemented by means of a list-processing system is much less dependent upon the characteristics of the particular computer used than if basic machine language instructions are employed. In combination with the ease of coding, this independence permits the evaluation of the relative effectiveness of several diverse algorithms or heuristic implementations of a single algorithm. This paper demonstrates the usefulness of the MIT 709 LISP I System in coding several procedures of determination of the prime implicants and irredundant forms of a truth function. The capabilities and limitations of these programs are discussed as is their application to evaluating the algorithms they represent. (Author)

AD-273 785 Div. 30, 15
(TISTP/MFA) OTS price $2.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
A SOLID STATE BUFFER-MEMORY SYSTEM TO HANDLE RANDOMLY TRANSMITTED INFORMATION,
by Richard M. Horowitz. 13 Feb 62, 10p. illus.
(Rept. no. 52G-1)
(Contract AF 19(604)7400)
(AFESD TDR 62-69) Unclassified report

DESCRIPTORS: (*Information theory, *Memory devices, Data storage systems, Data transmission systems.) (Magnetic tape, Computers, *Data processing systems, Switching circuits, *Computer logic, Sequences, Coding, Probability.) (Time interval counters, Errors, Analysis.) Theses.

The digital data handling section in a West Ford receiver system performs the specific functions of temporarily storing and then transferring error and certain special data to a high speed magnetic tape unit for ultimate computer data processing. A fixed 16-bit binary word is repeatedly transmitted over the dipole channel. The returning bits of information are sequentially compared for errors with reproductions of the transmitted word. Discrepancies between the transmitted and received bits thus derived by comparison are assembled for subsequent storage and recording. In addition to the error word just mentioned, three other word types --- parameter, measurement and radar, each containing 96 bits of information pertinent to other aspects of the communication experiment, are also assembled for processing. (Author)

AD-273 892 Div. 30, 1, 27
(TISTA/VGW) OTS price $1.50

Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
ACOUSTICAL EVALUATION OF F-102 PRODUCTION SILENCER CONVAIR, SAN DIEGO.
Rept. on Human Response to Vibratory Energy, by David N. Keast. Nov 61, 47p. incl. illus. tables, 12 refs.
(Contract AF 33(616)3938, Proj. 7210)
(WADC TN 57-390) Unclassified report

DESCRIPTORS: (Tests of *Acoustic insulation for Jet fighters.) (Effectiveness as Suppressors of *Jet engine noise, Sound transmission, Sound, Pressure.) (Acoustic insulation of *Test facilities, Buildings.)

The F-102 production silencer enclosure at Convair-San Diego has been evaluated acoustically. This silencer is similar to a turbojet engine test cell, but is designed to enclose a complete aircraft. Measurements of sound pressure level in and around the silencer are reported, and the noise reductions of the various elements of the acoustical treatment, as well as the noise reduction of the silencer as a whole, are determined. The results indicate that the average insertion-loss noise reduction of the silencer at 250 feet increases from about 20 db in the 20-75 cps band to somewhat greater than 50 db for all frequencies above 300 cps. (Author)

31. SHIPS AND MARINE EQUIPMENT

AD-273 550 Div. 31, 9
(TISTE/NTM) OTS price $8.60

Grumman Aircraft Engineering Corp., Bethpage, N. Y.
DESIGN, DEVELOPMENT AND INITIAL TESTS OF ONR

SUPERCAVITATING HYDROFOIL BOAT XCH-6,
by Charles Tilgner, III. Feb 62, 92p. incl. illus. 3 refs. (Rept. no. 133)
(Contract Nonr-269500)
Unclassified report

Original contains color plates; all ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: (*Hydrofoil boats, Cavitation, Construction, Design, Tests.) (*Hydrodynamics, Hydrofoils, Ship hulls, Aluminum, Control systems, Transmissions, Gas turbines, Marine engines, Marine propellers, Instrumentation, Gas flow, Marine engineering.)

The XCH-6 is the first supercavitating hydrofoil open water test craft. A total of 13 hrs, 48 min. of development testing was completed. The testing and development work produced a craft which is statically and dynamically stable about all 3 axes over the speed range from 0 to 50 mph. Cavity flow conditions are also stable. A pitching instability problem due to air entrainment around the pod, as well as various other structural and flow problems encountered, were resolved. The General Electric T-58 gas turbine power plant was modified, to provide resistance to the effects of operation in a salt laden atmosphere. Specifications for modification, operation and maintenance of this engine were developed. A 200 hp, 6000 rpm, right angle, over-the-stern drive in a minimum size envelope was designed, fabricated, tested and modified to provide power transmission to the propeller. (Author)

AD-273 660 Div. 31
(TISTB/LH) OTS price $14.00

Autonetics, Downey, Calif.
AN ANNOTATED LITERATURE SURVEY OF SUBMARINES, TORPEDOES, ANTI-SUBMARINE WARFARE, UNDERSEA WEAPON SYSTEMS, AND OCEANOGRAPHY: 1941 TO JANUARY 1962,
by Barbara Ann Bryce. 9 Mar 62, 1v. (Rept. no. EM-11-62-102)
Unclassified report

DESCRIPTORS: (*Bibliography, *Antisubmarine warfare, *Submarines, *Torpedoes, *Oceanography.) (Undersea warfare, Control systems, Nuclear propulsion, Submarine periscopes, Submarine noise.)

AD-273 840 Div. 31
(TISTE/CAM) OTS price $2.60

Rubber Lab., Mare Island Naval Shipyard, Vallejo, Calif.
VIBRATION DAMPING TREATMENTS FOR NEW CONSTRUCTION SUBMARINES.
Progress rept. no 11,
by J. Oser. 23 Mar 62, 10p. illus. tables.
(Rept. no. 94-37)
(Proj. S-F013-13-01)
Unclassified report

DESCRIPTORS: (*Submarine hulls, *Ship plates, Vibration, Damping, Temperature, Tests.) Steel, Rubber, Vulcanizates, Plastics, Organic materials, Acetates, Vinyl radicals.

Work continued on the investigation of vibration damping treatments for thick plates of submarines. It was found that the effect of temperature on the damping of the treatments utilizing chromated felt was due to the materials which were incorporated in the felt, rather than to the felt proper. Two unconstrained treatments were tested on 3/4 inch and 1-3/4 inch thick steel bars. One of these treatments, Type H, was a nitrile rubber vulcanizate. The other was a plastic compound, the main ingredient of which was a modified polyvinyl acetate. Higher average dampings over the frequency range between 50 and 2000-c were obtained at 85 F with 2 constrained chromated felt treatments, of a weight ratio of treatment to steel of 0.25, than with the 2 types of unconstrained treatments of 0.25 or 0.30 weight ratios. It was concluded that the 2 unconstrained treatments tried were not as satisfactory as the constrained felt treatments for damping thick plates on submarines. (Author)

32. MISCELLANEOUS ARTS AND SCIENCES

AD-273 500 Div. 32, 30
(TISTP/FR) OTS price $3.60

Indiana U., Bloomington.
AUTOMATIC LANGUAGE ANALYSIS.
Quarterly rept. no. 7,
by F. W. Householder, Jr. and J. P. Thorne.
1 Mar 62, 37p.
(Contract AF 30(602)2185)
Unclassified report

DESCRIPTORS: (*English language, *Vocabulary, Statistical analysis, Digital computers, Programming.) Machine translation.

A new approach to the mechanical analysis of English is outlined. Essentially it is a technique of analysis by successive approximation. It uses a more or less conventional dictionary giving form class (part of speech) assignment, or assignments, to each item. With some exception, in each case where a work is assigned to more than one form class it enters a routine to determine the class to which it belongs in the particular case under analysis. These routines involve the examination of the immediate environment of the ambiguous item and are based on a close study of group structure in English. (Author)

AD-273 581 Div. 32, 15
(TISTP/MFA) OTS price $2.60

Applied Mathematics and Statistics Labs., Stanford U., Calif.
TAX DEPRECIATION POLICY AND INVESTMENT THEORY,
by Vernon L. Smith. 27 Feb 62, 19p. refs.
(Technical rept. no. 109)
(Contract Nonr-22550, Proj. NR-047-004)
Unclassified report

DESCRIPTORS: (*Economics, Management engineering, Social sciences, *Costs.) (*Statistical analysis, Probability, Complex variables, Differential equations.)

A discussion of tax depreciation policy within the framework of the theory of investment of a firm is presented. It is assumed throughout that it is desirable to impose taxes on business income in such a way that the structure of optimal

investment decision rules is not altered by the tax. By way of motivational argument it should be emphasized that the present value theory of investment decisions makes no use of the concept of depreciation as a write-off phenomenon, though it is possible to interpret various approaches to the so-called depreciation problem in terms of this theory. Taxless investment theory treats all receipts and outlays as cash inflows and outflows at the instant received or expended, and seeks to maximize the present worth of this lumpy net cash inflow. Sunk investments enter this stream only to the extent that they contribute to current receipts, current expenses, and provide lump-sum disinvestment receipts through salvage or resale. The capital outlays for sunk investments do not enter the future income stream and do not affect investment decisions. (Author)

33. TRANSPORTATION

AD-273 547 Div. 33
(TISTA/WAW) OTS price $7.60

Federal Aviation Agency, Washington, D. C.
NORTH ATLANTIC AIR TRAFFIC ANALYSIS: AUGUST 25, 1961, FLIGHT DATA,
by Richard M. Warfield. Feb 62, 65p. incl. illus. tables.
(Proj. 101-43-5S)

Unclassified report

DESCRIPTORS: (*Air traffic, Air transportation, Atlantic Ocean, Statistical analysis.)

Flight data are summarized for August 25, 1961, the second of 12 monthly peak days to be analyzed in conjunction with the North Atlantic Region Traffic Survey being conducted by the United States Federal Aviation Agency. The material presented was prepared from machine tabulations of flight plan information coded into IBM cards. A total of 417 unduplicated flights (i.e., flights counted only once regardless of the number of OACC's involved) flew somewhere within the North Atlantic Region between 0000-2359Z on August 25, 1961. Forty of these flights were airborne at 0000Z and 27 were airborne after 2359Z. To eliminate the overlap incurred by counting both flights airborne at the beginning as well as the end of the day, the 27 flights airborne at the end of the day were subtracted from the 417 flights to give a representative peak day total of 390 flights. Most of the tabulations are in terms of these 390 flights. The distribution of these flights by ownership and aircraft class is summarized. Flights classified relative to the North Atlantic Region (12 OACC's) are summarized. The peak instant for airborne activity occurred at 0424Z when 85 aircraft were simultaneously airborne. (Author)

NON-MILITARY AND OLDER MILITARY RESEARCH REPORTS

*Descriptors marked with an asterisk

are included in the subject index.

BIBLIOGRAPHY

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LC 33.2: C44/961

Science and Technology Div., Library of Congress, Washington, D. C.
CHINESE SCIENTIFIC AND TECHNICAL SERIAL PUBLICATIONS IN THE COLLECTIONS OF THE LIBRARY OF CONGRESS, comp. by Joan Wu. Revised ed. 1961, 107p. 970 refs.

DESCRIPTORS: *Scientific reports, Science, Medicine, Agriculture, Engineering, Aeronautics, *China, *Bibliography, Periodicals.

Listed here are only those serials with a significant scientific or technical content. Entries are divided into seven major sections according to broad subject categories and divided into subsections. Within each unit the arrangement is alphabetical. Cross-references are provided when a serial overlaps various categories. In placing a serial in a given category, the actual subject content was followed, not the literal meaning of the title.

ASTRONOMY

Astrophysics

AD-273 604 repriced $2.00

Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
IMPACT STUDIES ON LUNAR DUST MODELS AT VARIOUS VACUUMS, by Richard Lansing Geer. Master's thesis. Jan 62, 79p. 33 refs. ASD Technical rept. 61-595.

DESCRIPTORS: *Space environmental conditions, Lunar probes, Particles, Distribution, Microstructure *Planetary atmospheres, Moon, Simulation, Model tests, Vacuum apparatus.

An analysis of the factors relevant to lunar environmental simulation show that the dynamic behavior of lunar dust models in various vacuums must be studied to establish the degree of vacuum required of a lunar simulator. Various silicic and basaltic rock dusts were selected as lunar dust models and tested under a range of vacuums. Although crater width measurements indicate lunar dust models do not change their resistance to impact at vacuums beyond 1 10^{-3} mm Hg, depth of penetration measurements do show a continuous change in resistance up to 1×10^{-5} mm Hg, the limit of the test. The behavior of lunar dust particles depend upon both particle size distribution and particle microstructure. The effects of hold times at vacuum, container walls, dust shallowness, and the composition of the residual atmosphere on dust behavior are analyzed. Recommendations are made for follow-up studies. (Author)

PB 159 905 $1.10

Cornell U. [School of Electrical Engineering] Ithaca, N. Y.
RADIO ASTRONOMY. Status rept. no. 14 on Contract Nonr-401(27). 14 Mar 60, 6p. Research rept. RS3; AD-236 451.

DESCRIPTORS: *Radio astronomy, Solar atmosphere, *Ionosphere, *Magnetic field, Polarization, Radiometers, Radar, Design.

An experiment was arranged which consists of measuring the polarization in short solar bursts simultaneously in 2 narrow bands, slightly separated in frequency. The center frequencies will be about 201.60 and 201.59 mc. A series of observations is proposed for studying the effects of Faraday rotation in the solar corona. (Author)

BEHAVIORAL SCIENCES

PB 159 895 $16.00

American Council on Education, Washington, D. C.
THE PRODUCTION OF DOCTORATES IN THE SCIENCES: 1936-1948, by Douglas E. Scates, Bernard C. Murdoch, and Alice V. Yeomans, Rept. on Contract N7onr-422. Sep 51, 249p. 57 refs. ATI-191 867.

DESCRIPTORS: *Scientific personnel, Personnel, Education, Data, Collecting methods, Abundance.

Contents:
Plan and procedure
Trends in the production of doctorates
Twenty thousand scientists who earned doctor's degrees
Physicists -- An analysis of one group of scientists
Geographic mobility of scientists associated with the Pacific Division
Appendix
List of publications

BIOLOGICAL SCIENCES

PB 159 908 $12.00

Coastal Studies Inst., Louisiana State U., Baton Rouge.
COASTAL PLANT GEOGRAPHY OF MAURITIUS, by Jonathan D. Sauer (U. of Wisconsin). Technical rept. no. 15, part A, on Contract Nonr-1575(03). 15 Apr 60, 161p. 67 refs. Contribution no. 61-3; AD-254 240.
DESCRIPTORS: *Plants, Trees, Meteorological data, *Geography, Indian Ocean.

TID-15141 $1.60

Cornell U. Medical Coll., New York.
SOME PHYSICAL CHEMICAL PROPERTIES OF RIBONUCLEOPROTEIN FROM RAT LIVER MICROSOMES, by Mary G. Hamilton, Liebe F. Cavalieri, and Mary L. Petermann. Rept. on Contract AT(30-1)-910. 1961. 20p.

Anatomy and Physiology

AD-273 602 repriced $0.75

Aerospace Medical [Research Labs.] Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
MOTION SICKNESS AND SPATIAL PERCEPTION. A THEORETICAL STUDY, by Jack E. Steele. Rept. on Complex Response of the Individual to Acoustic Energy. Nov 61, 29p. 63 refs. ASD Technical rept. 61-530.

DESCRIPTORS: *Motion sickness, Theory, Nervous system, Perception, Sensory perception, Acceleration tolerance, Physiology

Theories of motion sickness are reviewed and compared with a new theory in which the activity of the central nervous system is more important than the intensity or modality of sensory stimulation. Concepts treated are the development and validation of an inertial reference frame; the perceptual transformation of sensory data, which reduces its content, increases it reliability and can incorporate compensations for environmental variables, and the consequences of perceptual inadequacy. (Author)

PB 159 893 $1.60

Kresge Eye Inst., Detroit, Mich.
A REVIEW OF THE METHODS PREVIOUSLY EMPLOYED TO PRODUCE A HOMOGENEOUS VISUAL FIELD AND THE DESCRIPTION OF A NEWLY DEVISED TECHNIQUE, by James W. Miller. Rept. on Contract Nonr-586(00). 1 Aug 57, 14p. 11 refs. Joint Proj. rept. no. NM 17 01 99, rept. no. 14; AD-144 362.

DESCRIPTORS: Vision, Visibility, *Visual perception, Instrumentation, Conditioned reflexes, Visual acuity.

A newly devised method for producing a homogeneous visual field is described. It is pointed out that the apparatus permits the manipulation of the hue, saturation, brightness, and density of the whole visual field. The apparatus consists of a doublewalled, clear Plexiglas bell filled with a liquid fogging solution through which the observer views a uniformly illuminated white field. The liquid fog has the effect of obliterating all imperfections in the field, which results in producing a virtually unlimited homogeneous field. A number of problems are mentioned which have not been investigated previously due to instrumentation difficulties but which may be examined utilizing this apparatus. (Author)

AD-273 513 repriced $1.25

Ohio State U. Research Foundation, Columbus.
THE CORONARY HEMODYNAMIC RESPONSE TO ENVIRONMENT, by Leo A. Sapirstein and Eric Ogden Rept. on Physiology Research, Contract AF 33(616)6928. Nov 61, 43p. 16 refs. ASD Technical rept. 61-616.

DESCRIPTORS: Dogs, *Pressure suits, *Physiology, *Heart, *Blood circulation, Blood volume, Measurement, Arteries, Pressure, Blood plasma, Blood proteins, Proteins, Space medicine, Space environmental conditions.

Positive pressure breathing with 100 percent oxygen in dogs wearing bladder-type partial pressure suits causes major reduction in the cardiac output despite equal counter pressure to the respiratory passageway and the absence of pulmonary hyperinflation. These experiments were carried out to investigate the possibility that the circulatory defect was a consequence of defective myocardial perfusion. The experimental work revealed that coronary blood flow was significantly reduced in dogs wearing the pressure suit. The reduction in coronary flow was insignificantly less than the reduction in cardiac output and the coronary resistance was increased. This is in contrast with what is observed when the primary circulatory defect is one of the failure of venous return. This suggests that the major circulatory difficulty encountered in the pressure suit used may be a consequence of coronary vasoconstriction as a primary event. The circulatory failure which occurs in the pressure suit may be of cardiac rather than peripheral origin. (Author)

Pathology

AD-273 667 repriced $0.50

Aerospace Medical Research Labs., Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
THE ELECTROCARDIOGRAM AND VECTORCARDIOGRAM OF NORMAL MACACA MULATTA IN DORSAL-SUPINE, RIGHT-LATERAL, LEFT-LATERAL, AND SITTING POSITIONS, by F. R. Robinson and R. L. Hamlin. Rept. on Biomechanics of Aerospace Operations. Dec 61, 18p. 13 refs. ASD Technical rept. 61-738.

DESCRIPTORS: *Primates, *Electrocardiography, *Vectorcardiography, Heart, Posture, Physiology, Experimental data, Analysis, Space medicine, Impact shock.

Electrocardiograms and vectorcardiograms of 11 normal monkeys placed in dorsal-supine, right-lateral, left-lateral, and sitting positions were analyzed and results presented. This information is of immediate importance in determining electrocardiographic and vectorcardiographic changes that may be induced in monkeys by lateral impact. Leads taken were I, II, III, aVR, aVL, aVF, MF_1, MV_2, and MV_3. Parameters analyzed from the electrocardiogram lead II included: rhythm, rate, PR interval, P wave duration, PQ segment duration, and QRS duration. The mean P vector projection in the frontal plane was also calculated. Amplitudes of the component deflections in

leads I, aVF, and MV_1 were determined. Vectorcardiograms were analyzed for: direction of inscription, ratio of length to width, and the mean axis of the QRS vector projected on the three planes for each body posture. This report will serve as a base line for analysis for electrocardiographic or vectorcardiographic data analyzed in experiments on monkeys placed in any of the four positions. (Author)

PB 159 898 $1.60

School of [Aerospace] Medicine [Brooks AFB] Tex.
CEREBRAL LOCALIZATION AND CLASSIFICATION OF CONVULSIONS PRODUCED BY SEVERE OXYGEN LACK: ELECTROENCEPHALOGRAPHIC STUDIES ON RABBITS, by Werner Noell and Edmund B. Dombrowski. 15 July 47, 18p. Proj. no. 497, rept. no. 1; AD-63 390.

Figures will not reproduce well.

DESCRIPTORS: Rabbits, *Electroencephalography, *Convulsions, Classification, *Anoxia, Pathology, Brain, Cerebral cortex, Epilepsy.

In the preconvulsive state, definite phenomena were observed which consisted of increased excitability to afferent stimuli with increased radiation of these responses, abnormal opening of reflex pathways, increase of after discharges and early increase followed by late decrease of spontaneous activity of higher centers. During convulsions in anoxia, the outstanding features were the relative electrical silence of the cortex and the marked activity in the brain stem. The upper limit of the activity was at the level of the rostral part of the pons just behind the outflow of the oculomotor nerve. The greatest bioelectric activity occurred in the reticular formation. Anoxic convulsions differ markedly in their bioelectric activity from epileptic convulsions. It is concluded that release phenomena plus the increased excitability of the brain stem and presumably of the spinal cord is responsible for the production of anoxic convulsion. After revival from anoxia there is a temporary lowered threshold in the cortex for epileptiform seizures which resembles a latent epilepsy. (Author)

Radiobiology

TID-3569 $1.75

Atomic Energy Commission. Div. of Technical Information Extension, Oak Ridge, Tenn.
RADIOBIOLOGICAL REVIEW ARTICLES, comp. by Charles M. Pierce. Jan 62, 71p. 1765 refs.

ORO-517 $2.25

Research Lab., U. of Tennessee, Oak Ridge.
SEMI-ANNUAL PROGRESS REPORT, 1 JANUARY-30 JUNE 1961. Rept. on Contract AT(40-1)-GEN-242. Mar 62, 103p. 16 refs.

UR-598 $2.60

Rochester U. School of Medicine and Dentistry, N. Y.
CONCEPT AND CRITERIA OF RADIOLOGIC AGING, by George W. Casarett. Rept. on Contract W-7401-eng-49. 1 Aug 61, 28p. 22 refs.

UR-606 $1.60

Rochester U. School of Medicine and Dentistry, N. Y.
THE SEPARATION AND DETERMINATION OF PLUTONIUM IN DIVERSE BIOLOGICAL SAMPLES, by Taft Y. Toribara, Carol Predmore, and Paul A. Hargrave. Rept. on Contract W-7401-eng-49. 22 Jan 62, 12p.

TID-15047 $2.60

Roscoe B. Jackson Memorial Lab., Bar Harbor, Maine.
THE OCCURRENCE OF CHROMOSOMAL ABERRATIONS IN PRESPERMATOCYTIC CELLS OF IRRADIATED MALE MICE, by Allen B. Griffen. Progress rept. 1 Feb 61-31 Jan 62, and fourth renewal proposal, 1 June 62-31 May 63, on Contract AT(30-1)-2113. 1 Mar 62, 22p.

TID-14965 $14.00

Woods Hole Oceanographic Institution, Mass.
BIOLOGICAL, CHEMICAL, AND RADIOCHEMICAL STUDIES OF MARINE PLANKTON. Progress rept. 1 Jan-31 Dec 61, on Contract AT(30-1)-1918. 15 Feb 62, 204p. Ref. no. 62-4, app.

CHEMISTRY

IS-350 $2.25

Ames Lab., Iowa State U. of Science and Tech.
ANNUAL SUMMARY RESEARCH REPORT IN CHEMISTRY, 1 July 60-30 June 61, on Contract W-7405-eng-82. Sep 61, 122p. 180 refs.

ORNL-TM-107 $4.60

Oak Ridge National Lab., Tenn.
CHEMICAL TECHNOLOGY DIVISION, CHEMICAL DEVELOPMENT SECTION C PROGRESS REPORT FOR OCTOBER-DECEMBER 1961, by K. B. Brown. Rept. on Contract (W-7405-eng-26). 21 Feb 62, 48p.

OTS SB-492 $0.10

Office of Technical Services, Dept. of Commerce, Washington, D. C.
FLUORIDES. Feb 62, 17p. 196 refs. OTS Selective Bibliography SB-492.

DESCRIPTORS: *Fluorides, *Fluorocarbons, *Bibliography.

Lists 196 foreign and domestic reports on fluorides added to the OTS collection during the period 1946 to February 1962. Covers research on transition element fluorides, nitrogen fluorides and their organic

derivatives, elastomers and polymers, fluoride formation in atomic reactors, oxyfluorides, molten fluoride systems, zirconium fluoride phase studies, preparation of yttrium fluoride, nitrosyl and carbonyl fluorides among other subjects. FLUORINE and FLUORINE COMPOUNDS appear in SB-491 and FLUOROCARBONS in SB-493. (Author)

OTS SB-491 $0.10

Office of Technical Services, Dept. of Commerce, Washington, D. C.
FLUORINE AND FLUORINE COMPOUNDS. Feb 62, 16p. 423 refs. OTS Selective Bibliography SB-491.

DESCRIPTORS: *Fluorine, *Fluorides, *Bibliography, Fungicides, Combustion.

Lists 243 foreign and domestic reports on fluorine and its organic and inorganic compounds added to the OTS collection during the period 1946 to February 1962. Covers research on production; storage, handling and disposal; corrosive effects; fungicides; combustion research; radiochemistry of fluorine; chemistry of fluorine and its compounds among other subjects. FLUORIDES are covered in SB-492 and FLUOROCARBONS in SB-493.

OTS SB-493 $0.10

Office of Technical Services, Dept. of Commerce, Washington, D. C.
FLUOROCARBONS. Feb 62, 8p. 97 refs. OTS Selective Bibliography SB-493.

DESCRIPTORS: *Fluorocarbons, *Fluorides, *Bibliography, Lubricants, Hydraulic fluids, Polymers, Resins.

Lists 97 foreign and domestic reports on preparation and chemistry of fluorocarbons; fluorocarbon lubricants and hydraulic fluids; fluorocarbon polymers and resin among other subjects. FLUORINE and FLUORINE COMPOUNDS appear in SB-491 and FLUORIDES in SB-492. (Author)

Analytical Chemistry

MCW-1471 $1.50

Mallinckrodt Chemical Works, Weldon Spring, Mo.
PROCESS DEVELOPMENT. Quarterly progress rept. Oct-Dec 61, on Contract W-14-108-eng-8. 1 Feb 62, 58p. 23 refs.

NBL-177 $1.25

New Brunswick Lab., N. J.
SEMIANNUAL PROGRESS REPORT FOR THE PERIOD JANUARY-JULY 1961. Mar 62, 55p. 8 refs.

PWAC-367 $0.75

Pratt and Whitney Aircraft Div., United Aircraft Corp., Middletown, Conn.
METHODS FOR THE CHEMICAL ANALYSIS OF URANIUM MONOCARBIDE. Rept. on Contract AT(30-1)-2789. 15 Mar 62, 35p. 8 refs.

Y-1384 $1.25

Union Carbide Nuclear Co., Oak Ridge, Tenn.
INSTRUMENTAL METHODS OF URANIUM ANALYSIS. Rept. on Contract W-7405-eng-26. 17 Apr 62, 56p.

Physical Chemistry

NAA-SR-6643 $0.50

Atomics International, Canoga Park, Calif.
PREPARATION OF STOICHIOMETRIC UO_2 THERMAL DECOMPOSITION OF UO_2I_2, by L. Lynds. Rept. on Contract AT(11-1)-GEN-8. 1 Apr 62, 18p. 28 refs.

HW-70536 $0.75

Hanford Atomic Products Operation, Richland, Wash.
ABSORPTION OF THORIUM ON AN ANION EXCHANGE RESIN, by J. L. Carroll. Rept. on Contract AT(45-1)-1350. 8 Sep 61, 32p. 8 refs.

LA-2661 $0.50

Los Alamos Scientific Lab., N. Mex.
TEMPERATURE-COMPOSITION DIAGRAMS OF PSEUDO-BINARY SYSTEMS CONTAINING PLUTONIUM(III) HALIDES, comp. by J. A. Leary. Rept. on Contract W-7405-eng-36. 19 Apr 62, 16p. 6 refs.

TID-15153 $13.00

Michigan U., Ann Arbor
THERMODYNAMIC PROPERTIES OF METHYL ALCOHOL, 2-METHYL- AND 2,5-DIMETHYL-THIOPHENE AND 2-METHYLFURAN, by Harold Gary Carlson. Doctoral thesis. Rept. on Contract AT(11-1)-70. 1962. 183p.

Y-1380 $0.75

Union Carbide Nuclear Co., Oak Ridge, Tenn.
RECLAMATION OF BERYLLIUM CHIPS BY ELECTROLYSIS, by F. A. Schimmel. Progress rept. to 31 July 61, on Contract W-7405-eng-26. 12 Apr 62, 30p. 8 refs.

EARTH SCIENCES

PNE-109P $1.25

Stanford Research Inst., Menlo Park, Calif.
EARTH DEFORMATION FROM A NUCLEAR DETONATION IN SALT, by R. B. Hoy and R. M. Foose. Plowshare Program, Project Gnome. 28 Mar 62, 50p. 11 refs.

PNE-111P $1.50

Stanford Research Inst., Menlo Park, Calif.
INTERMEDIATE RANGE EARTH MOTION MEASUREMENTS. Preliminary rept. Plowshare program, Project Gnome. 21 Mar 62, 53p. 52 refs.

Climatology and Meteorology

SCTM-123-61(72) $1.60

Sandia Corp., Albuquerque, N. Mex.
HUMIDITY INDICATOR (MODEL 2C), by C. M. Stover. Rept. on Contract AT(29-1)-789. Nov 61, 17p.

SCR-474 $3.60

Sandia Corp., Albuquerque, N. Mex.
RAIN MEASUREMENT AND SIMULATION FOR SUPERSONIC EROSION STUDIES, by Marcel C. Reynolds. Rept. on Contract AT(30-1)-789. Feb 62, 36p.

For presentation at Institute of Environmental Sciences, Chicago, Ill., 11-13 Apr 62.

Geology

RME-4524(Rev.) $0.50

Atomic Energy Commission. Div. of Raw Materials, Washington, D. C. and Instituto de Investigaciones Geológicas, Santiago (Chile)
RECONNAISSANCE FOR URANIUM IN THE MAMINA AREA, PROVINCE OF TARAPACA, CHILE, by Paul H. Knowles, William A. Bowes and others. Oct 58, 14p. 5 refs.

UCRL-13032 $8.10

Colorado School of Mines Research Foundation, Inc., Golden.
SOURCES OF INFORMATION ON ROCK PHYSICS. Current Literature, 31 Jan 62, by Lorraine Burgin. Rept. on Contract [W-7405-eng-48]. 31 Jan 62, 85p.

Order from GPO $2.00 as I 19.3:1145

Geological Survey, Washington, D.C.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1959, by Ruth Reece King, Virginia M. Jussen and others. 1961, 605p. 4017 refs. Geological Survey bulletin 1145.

DESCRIPTORS: *Geology, *North America, *Bibliography.

The current volume lists publications that appeared during 1959 on the geology of the United States (including Alaska and Hawaii), the rest of the North American continent including Greenland, the West Indies, and adjacent islands, and also Guam and other Pacific island possessions-but not the trust territories of the United States. The citations are listed alphabetically by author, with full title and publication data. There follows a subject index to the papers cited.

Order from GPO $0.20 as I 19.3:1133-A

Geological Survey, Washington, D. C.
GEOLOGY AND HYDROLOGY OF THE PIQUA AREA, OHIO. STUDIES OF SITES FOR NUCLEAR ENERGY FACILITIES, by Stanley E. Norris and Andrew M. Spieker. 1961, 33p. 12 refs. Geological Survey bulletin 1133-A.

DESCRIPTORS: *Geology, *Hydrology, *Ohio, Nuclear power plants, Power reactors, Operation, Feasibility studies.

Order from GPO $1.00 as I 19.3:1108-B

Geological Survey, Washington, D. C.
GEOLOGY OF THE CRAIG QUADRANGLE, ALASKA. MINERAL RESOURCES OF ALASKA, by W. H. Condon. 1961, 43p. 33 refs. Geological Survey bulletin 1108-B.

DESCRIPTORS: *Geology, Geological survey, Rock, *Minerals, Deposits, *Alaska.

Order from GPO $1.00 as I 19.3:1063-B

Geological Survey, Washington, D. C.
GEOLOGY OF THE DEWEY QUADRANGLE WYOMING-SOUTH DAKOTA. GEOLOGY OF URANIUM DEPOSITS IN SOUTHERN BLACK HILLS, by Donald A. Brobst. 1961, 47p. 27 refs. Geological Survey bulletin 1063-B.

DESCRIPTORS: *Geology, Geological survey, *Uranium, Deposits, *South Dakota, *Wyoming, Economics, Shale, Rock, Sand, Minerals, Oils, Natural gas.

Order from GPO $0.30 as
I 19.16:414-A

Geological Survey, Washington, D. C.
INTERPRETATION OF THE COMPOSITION AND A CLASSIFICATION OF THE CHLORITES. SHORTER CONTRIBUTIONS TO GENERAL GEOLOGY, by Margaret D. Foster. 1962, 33p. 23 refs. Geological Survey Professional Paper 414-A.

DESCRIPTORS: *Chlorites, Classification, Chemical analysis, Ions, Distribution, Geology.

Structural formulas calculated for more than 150 selected published analyses of chlorites show that octahedral Al is not often closely equivalent to tetrahedral Al, being higher in about one-fourth of the formulas, and lower in about one-half. Two series of ionic replacements characterize the chlorites, replacement of tetrahedral and octahedral Al by Si and Mg, and replacement of Mg by Fe^{+2}. A classification scheme for the chlorites, based on these two replacement series, divides the chlorites into nine species which are strictly defined on the basis of Si content and ratio of Fe^{+2} to R^{+2}. After consideration of various ways of distributing the octahedral cations between the two octahedral layers, it is concluded that an equal distribution of the various kinds of octahedral ions present is most likely, but that the way the ions are distributed may not necessarily be the same in all chlorites.

Order from GPO $0.60 as
I 19.16:354-J, K.

Geological Survey, Washington, D. C.
LITUYAPECTEN (NEW SUBGENUS OF PATINOPECTEN) FROM ALASKA AND CALIFORNIA [AND] STRATIGRAPHIC OCCURRENCE OF LITUYAPECTEN IN ALASKA. SHORTER CONTRIBUTIONS TO GENERAL GEOLOGY, by F. Stearns MacNeil and Don J. Miller. 1961, 25p. 34 refs. Geological Survey Professional Paper 354-J, K.

DESCRIPTORS: *Geology, *Paleoecology, Ecology, *Alaska.

Order from GPO $0.20 as
I 19.16:414-B

Geological Survey, Washington, D. C.
MOHR'S THEORY OF STRENGTH AND PRANDTL'S COMPRESSED CELL IN RELATION TO VERTICAL TECTONICS. SHORTER CONTRIBUTIONS TO GENERAL GEOLOGY, by S. P. Kanizay. 1962, 16p. 13 refs. Geological Survey Professional Paper 414-B.

DESCRIPTORS: *Geology, Structures, *Plasticity, Plastic flow, Deformation, Stresses, Mechanical properties, Mountains.

Mohr's theory of strength, given in functional form is particularized graphically such that failure occurs along planes oriented at right angles to the largest principal stress when failure is under tension, and along complementary orthogonal slip planes, whose orientation ranges from 30^{o} to 45^{o} with the largest principal stress in failure under compression. It is proposed that a correlation exists between mean stress, as measured along the σ-axis of a modified Mohr yield envelope, and depth in the earth's crust such that there is a functional relationship in which mean stress increases with depth. The type of deformation varies with mean stress; as mean stress increases, deformation is characterized by less brittle and more plastic behavior.

Order from GPO $0.20 as
I 19.16:383-A

Geological Survey, Washington, D. C.
STORAGE OF GROUND WATER BEHIND SUBSURFACE DAMS IN THE COLUMBIA RIVER BASALT, WASHINGTON, OREGON, AND IDAHO. HYDROLOGY OF VOLCANIC-ROCK TERRANES, by R. C. Newcomb. 1961, 15p. 7 refs. Geological Survey Professional Paper 383-A.

DESCRIPTORS: *Hydrology, *Dams, *Water, *Storage, Washington, Oregon, Idaho, Geological survey

Properly designed and constructed test wells are suggested as a means of determining the feasibility of withdrawing water from ground-water reservoirs during the growing season and allowing the reservoirs to refill during the winter and spring. Benefits from such a practice may be especially great in stream valleys where water is needed in the late summer.

Order from GPO $2.00 as
I 19.16:361

Geological Survey, Washington, D. C.
STRATIGRAPHY OF THE EAST TINTIC MOUNTAINS, UTAH [AND] QUATERNARY DEPOSITS, by H. T. Morris, T. S. Lovering, and H. D. Goode. 1961, 146p. 103 refs. Geological Survey Professional Paper 361.

DESCRIPTORS: *Geology, *Deposits, Rock, Chemical analysis, Ores, Stratification, *Utah.

ENGINEERING

Order from GPO $0.35 as
I 19.16:282-G

Geological Survey, Washington, D. C.
FACTORS CONTROLLING THE SIZE AND SHAPE OF STREAM CHANNELS IN COARSE NONCOHESIVE SANDS. PHYSIOGRAPHIC AND HYDRAULIC STUDIES OF RIVERS, 1956-61, by M. Gordon Wolman and Lucien M. Brush, Jr. 1961, 27p. 22 refs. Geological Survey Professional Paper 282-G.

DESCRIPTORS: *Inland waterways, Hydraulic models, Sand, Hydrodynamics, Civil engineering, Construction, *Geological survey.

The size and shape of equilibrium channels in uniform, noncohesive sands, 0.67 mm and 2.0 mm in diameter, were studied experimentally in a laboratory flume 52 feet long in which discharge, slope, sediment load, and bed and bank material could be varied independently.

UCRL-6720 $0.50

Lawrence Radiation Lab., U. of California, Livermore.
CALIBRATION OF STRAIN GAGES AT HIGH TEMPERATURE, by William E. Bostwick. Rept. on Contract W-7405-eng-48. 11 Dec 61, 9p.

Aeronautical Engineering

AD-273 663 repriced $2.00

Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
DIGITAL OPTICAL TRACKING SYSTEM, by Albert J. F. Smith. Rept. on Aircraft Position Measurement Equipment. Jan 62, 71p. Technical documentary rept. no. ASD-TR-61-358.

DESCRIPTORS: *Digital computers, *Optical tracking, *Targets, Phototheodolites, Electronic equipment, Numerical analysis, Position finding, Instrumentation

This space-position measurement system comprises two Askania Kth 53 cinetheodolite instruments with digital encoders mounted externally on their azimuth and elevation axes, readout electronic equipment including multitrack tape recording and playback subsystems, and a conversion subsystem for entering digital data in a Burroughs 205 computer. Digitally, angular position readings are possible to ±1 part in 32768, and by a small modification, can be extended for azimuth angles to ±1 part in 65536. Sampling rates are 1, 2, 4, 8, or 16 per second. Instrument dial angular position capability is five seconds of arc, for which film recordings are available for visual scanning. Time, recorded in binary code, is accumulated each 2-second period in groups of eight frames each. Time correlation exists within the system, and is possible with external systems. (Author)

PB 159 883 $3.60

Air Materiel Command, Wright[-Patterson AFB] Ohio.
DYNAMIC OVERSTRESS IN AIRPLANE WINGS, by B. Smilg and H. W. Sibert. 16 Feb 39, declassified 23 Dec 59. 34p. Rept. no. TR-4437; ATI-21 261.

DESCRIPTORS: *Airplanes, *Wings, Stresses, Gust loads, Load distribution, Dynamics, Vibration, Deflection.

A study was made to derive theoretical values for the dynamic overstress in an airplane wing, in terms of the time required for the dynamic load to reach its maximum value and the natural period of vibration of the wing in bending. Results showed that the manner in which load is applied determines overstress; for gust load increasing uniformly overstress may be 17%; for gust load increasing from 0 in "inverted cosine fashion" overstress may be 6%; maneuver loads cause negligible overstress, and future planes may have 50% overstress.

AD-273 625 repriced $2.50

Goodyear Aircraft Corp., Akron, Ohio.
INVESTIGATION OF ESCAPE CAPSULE SYSTEMS FOR MULTI-PLACE AIRCRAFT. PART I. PRELIMINARY INVESTIGATION, by J. J. Vorachek, F. Milhoan and others. Final rept. pt. 1, on Contract AF 33(616)5017. Dec 61, 103p. 10 refs. WADC Technical rept. 57-329, pt. I.

DESCRIPTORS: *Aircraft, *Bombers, Cockpits, Noses, Airplane noses, *Ejection seats, Pitch, Stabilization, Acceleration, Load distribution, Supersonic planes, Aviation safety.

This report summarizes the findings of an investigation conducted by Goodyear Aircraft Corporation of four escape capsule systems for a hypothetical multiplace aircraft. Four capsule configurations are evaluated: cockpit, nose section, tandem, and individual. Evaluation is on the basis of the total ability to perform the escape function within the operational envelope requirements and compatibility with the aircraft and mission requirements. Pitch stabilization and acceleration loads are determined by solving performance equations by an IBM 650 digital computer. It was found that all the configurations provide the required escape potential, necessary crew comfort and access to work areas, and adequate survival potential. The individual capsule concept was found to be the most desirable arrangement on the basis of this analysis. (Author)

AD-273 626 repriced $5.00

Goodyear Aircraft Corp., Akron, Ohio.
INVESTIGATION OF ESCAPE CAPSULE SYSTEMS FOR MULTIPLACE AIRCRAFT. PART II. PRELIMINARY DESIGN AND WIND TUNNEL TESTING OF AN INDIVIDUAL ESCAPE CAPSULE, by F. M. Milhoan, J. J. Vorachek, and J. D'Allura. Final rept. pt. 2, on Contract AF 33(616)5017. Dec 61, 314p. 26 refs. WADC Technical rept. 57-329, Part II.

DESCRIPTORS: *Aircraft, *Bombers, Supersonic planes, *Ejection seats, Design, Wind tunnel models, Model tests, Stresses, Fins, Balloons, Configuration, Drag, Stabilization, Aviation safety.

This report presents the preliminary design and dynamic model and wind tunnel model testing of an individual escape capsule as a part of a program for the investigation of escape capsule systems for a hypothetical multi-place aircraft. The capsule will provide safe escape over an aircraft performance envelope having an 800-knot EAS from sea level to 55,000 feet and Mach 4.0 from 55,000 to 100,000 feet. The preliminary design, including major components and subassemblies, is described in detail. Major results from

stress and weight analyses are included. A preliminary performance and stability analysis of three capsule stabilization systems, including fins, boom-balloon configurations, and trailing drag bodies, was made, and a system comprised of a variable sized inflatable drag body was selected from this analysis and further analyzed. Data used for the analysis was obtained from transonic and supersonic wind tunnel tests from Mach number 0.5 to 3.0. (Author) (See also AD-273 625)

Chemical Engineering

HW-71388 $0.50

Hanford Atomic Products Operation, Richland, Wash.
A SENSITIVE FLOWMETER FOR MEASURING VERTICAL WELL FLOWS, by J. D. McCormack. Rept. on Contract AT(45-1)-1350. Nov 61, 14p. 10 refs.

ORNL-3244 $0.50

Oak Ridge National Lab., Tenn.
SEPARATION OF TRANSPLUTONIUMS AND LANTHANIDES BY TERTIARY AMINE EXTRACTION. II. CONTAMINANT IONS, by R. D. Baybarz and H. B. Kinser. Rept. on Contract W-7405-eng-26. Apr 62, 12p. 3 refs.

Electrical and Electronic Engineering

PB 159 909 $11.50

Airborne Instruments Lab., Inc., Deer Park, N. Y.
THE INVESTIGATION OF MULTIFEED ANTENNAS AND WIDE-ANGLE OPTICS, by W. D. White, L. J. Kuskowski, and L. K. De Size. Final rept. on Contract AF 30(602)1980. Dec 60, 158p. 3 refs. Rept. no. 7358-2; RADC-TR-61-12; AD-254 290.

DESCRIPTORS: Antenna radiation patterns, Mathematical analysis, Parabolic antennas, *Optics, Reflectors, Reduction, Lobing, Reflection, Design, Radar antennas, Tests, Radar tracking, *Antennas.

This report covers the results of an analytical study of an Schwarzschild antenna system and an experimental study of methods of reducing side-lobe levels that are due to aperture block in a two-reflector system. The investigation of side-lobe reduction for two-reflector systems has resulted in two successful techniques. The first technique uses a grid-type secondary reflector and a dielectric lens; however, this method is only applicable for systems having a very narrow RF bandwidth, since it is extremely frequency-sensitive. The second technique uses a semi-bootlace system, where a pickup horn is used in front of the secondary reflector to intercept energy from the primary feed, and in turn is coupled through an RF amplifier and phase shifter to a secondary feed that feeds the parabolic rear surface of the secondary reflector. Due to the presence of the phase shifter, this technique does not suffer from the frequency sensitivity of the first technique. It has also been demonstrated that side-lobe reduction can be obtained with off-axis feeds. (Author)

ANL-6524 $0.75

Argonne National Lab., Ill.
OPTIMIZATION OF EFFICIENCY OF A CESIUM DIODE CONVERTER, by C. K. Sanathanan. Rept. on Contract W-31-109-eng-38. Mar 62, 31p. 2 refs.

PB 159 881 $8.10

Cook Research Labs., Morton Grove, Ill.
HYDRAULIC SERVO CONTROL VALUES, PART 7: DESIGN FOR IMPROVED RELIABILITY, TOLERABLE OIL CONTAMINATION LEVEL STANDARDS, AND NUCLEAR REACTOR IRRADIATION TEST RESULTS, by Wayne L. Kinney, Phillip A. Weiss, and Eugene P. Schumann. Final rept. on Contract AF 33(616)5136. Jan 59, 84p. 6 refs. WADC Technical rept. 55-29, Pt. 7; AD-231 657.

DESCRIPTORS: *Hydraulic servomechanisms, Design, *Control valves, Reliability, Contamination, *Gamma rays, Neutron flux density, *Radiation damage.

Contents:
Valve design for improved life and reliability
Time-modulated valve
Parallel first-stage valve
Mechanical feedback valve-actuator
Effects of oil contamination on water
Tolerable oil contamination levels in typical electrohydraulic systems
Determination of the contamination levels of hydraulic systems used in operational fighter aircraft
Determination of a tolerable contamination level
Test program for verifying criteria
Tests of electrohydraulic servo valve and associated equipment under neutron and gamma-ray irradiation
Description of Convair reactor test facility
(See also PB 155 147)

PB 159 892 $2.60

Electron Tube Lab., Ohio State U. Research Foundation [Columbus].
MODIFICATIONS OF THE HEIL ELECTRON GUN, by John L. Peck. Engineering rept. on Wide Range Tuning Klystrons, Contract W33-038-ac-15162. Aug 53, 27p. 3 refs. AD-26 880.

DESCRIPTORS: Klystrons, *Electron guns, Design, Tests.

Performance and design data are given for several modifications of the Heil electron gun, which uses an elliptical-shaped cathode to produce a very dense point-focus beam. A current density of 50 amp/cm^2 in a beam of 0.015-inch diameter with a beam voltage

of 1000 is easily obtained. Dimensions and construction details are shown for the more useful modifications of the gun. (Author)

AD-273 063 repriced $11.00

Frebank Co., Glendale, Calif.
DESIGN, DEVELOPMENT AND TESTING OF NON-MODULATING PRESSURE CONTROL VALVES. VOLUME I, by Lynn K. Smith. Rept. on Contract AF 04(647)429. Dec 61, 144p. AFBSD-TR-61-71, v. 1.

DESCRIPTORS: Space flight, Guided missiles, *Control valves, *Gas valves, Valves, *Pressure regulators, Pressure switches, *Safety valves, Design, Tests

This report presents a brief background of the snap-action concept, a discussion of the design, development and testing of the components, and conclusions and recommendations.

DC-57-1-103 $1.60

General Electric Co., Cincinnati, Ohio.
HYSTERESIS RELAY, by A. D. Wilcox. Rept. on Contract AT(11-1)-171. 23 Jan 57, 17p.

PB 159 910 $3.60

International Resistance Co., Philadelphia, Pa.
RESISTORS, VARIABLE (FILM TYPE), ed. by B. Ingster. Quarterly progress rept. no. 6, 1 Sep-30 Nov 59, on Contract DA 36-039-sc-75981. [1959] 34p. AD-239 803.

DESCRIPTORS: *Variable resistors, Resistors, Films, Production.

Carbon alloy film deposited on 5 microinch Coors AD99 substrates has been selected for the resistive element. E-27, a brush-grade of carbon from Pure Carbon Co., has been selected as the wiper material. The element and wiper system has demonstrated the capability of meeting the contract requirements with the exception of T. C. in the highest ranges. Work has been started on incorporating the wiper and element into the final housing. The problems of adjusting resistance to the required tolerance and matching the "C" taper curve are being actively investigated. (Author)

PB 159 911 $2.60

International Resistance Co., Philadelphia, Pa.
RESISTORS, VARIABLE (FILM TYPE), by Jerome G. Burns and Mark Steidlitz. Quarterly progress rept. no. 7, 1 Dec-29 Feb 60, on Contract DA 36-039-sc-75981. [1960] 26p. AD-239 595.

DESCRIPTORS: *Variable resistors, *Resistors, Films.

On substrate reorder, difficulty has been encountered in the interpretation and inspection of the substrate surface finish specification. This is reflected in some poor results on rotational life testing. VZA, an IRC proprietary terminating material, is working well. Additional rotational life testing is required before final acceptance. Two substrate holding devices, one for each of the two sizes (1" and 1/2"), have been designed for the adjusting machine to allow adjustment to a desired resistance stop. A simplified taper process for the 1" control has been evolved using a screened pattern of VZA to reduce the available number of squares on one half of the element by a factor of ten. No rotational life data on this type of tapered element is available as yet; taper curves are shown. Complete designs of the RV10, RV11, and RV12 are available. Tooling has been ordered for the RV11 and RV12. Facilitation has been started. The carbon alloy deposition furnace has been designed, hardware tooling has been ordered, and all assembly jigs and test equipment have been ordered. (Author) (See also PB 159 910)

PB 159 912 $2.60

International Resistance Co., Philadelphia, Pa.
RESISTORS, VARIABLE (FILM TYPE), by Jerome G. Burns and Mark Steidlitz. Quarterly progress rept. no. 8, 1 Mar-31 May 60, on Contract DA 36-039-sc-75981. [1960] 29p. AD-240 355.

DESCRIPTORS: *Variable resistors, *Resistors, Films.

Tests were conducted on substrates to establish alternate vendors. Surface finish measurements have been established between IRC and Coors, and work was done to determine an optimum surface finish for the substrate. Work continued on the substrate molds and the formulation of a new alumina compound. Carbon alloy films were evaluated by testing on rotational load-life. Terminations using a thin coat of VZA proved successful. Screened segment tapering is now being used instead of the double deposition method. Work on the impact extrusion dies continued with some satisfactory results. Evaluations were made with point-shaped carbon contacts. Work on prototype machinery continued and final design work of these machines is nearly complete. Difficulties with screening the terminations has caused the abandonment of this method. Work is being done to replace this operation with a spraying technique. (Author) (See also PB 159 911)

PB 159 886 $16.00

Moore School of Electrical Engineering, U. of Pennsylvania, Philadelphia.
THEORY OF SWITCHING CIRCUITS. VOLUME I: UNIT-DISTANCE BINARY CODES, by Howard E. Tompkins. Doctoral thesis. Final rept. v. 1, on Contract DA 36-039-sc-72344. 1 Sep 57, 247p. 60 refs. Moore School rept. no. 58-09; AD-155 005.

DESCRIPTORS: Theses, *Switching circuits, Theory, *Coding, Analog-to-digital converters, Matrix algebra, Conformal mapping, Sequences

This paper presents the general theory of unit-distance binary codes and the techniques for their description and evaluation, with examples of application of the codes in analog-to-digital conversion. A unit-distance binary code is a digital number-representation system using binary symbols such as 0 and 1, in which the representations of any two successive natural numbers differ in only one binary place. Unit-distance codes have application wherever it is desirable to specify unambigously a definite order (sequence) of occurrences of events, for example in sequential switching-network design, and more commonly in analog-to-digital conversion. Discussions are presented on the representation of codisets, the construction of unit-distance first-order flight sequences, the construction of first-order cycles, zone-count in first-order codisets, second-order and n^{th}- order unit-distance codisets and cycles, one-zone n^{th}- order codes ($n > 2$), translation of factor codes in analog-to-digital systems, and detailed translation methods.

PB 159 896 $11.50

Pacific Semiconductors, Inc., Culver City, Calif.
VARIABLE CAPACITOR DIODES, by L. S. Chase, and H. D. Frazier. Final rept. 15 Apr 58-14 Apr 59, on Contract DA 36-039-sc-75044. [1959] 154p. AD-227 720.

DESCRIPTORS: *Variable capacitors, *Diodes, Semiconductors, Capacitors, Design.

The work performed on variable capacitor diodes is described. Results of development, fabrication and applications studies are presented. Design theory, fabrication techniques, and characteristics of abrupt-junction devices, representing a new order of performance capabilities are described. Preliminary development of hypersensitive variable capacitor diodes well beyond the previous state of the art is discussed. Information necessary for the duplication of units delivered is presented. Conclusions and recommendations are summarized. (Author)

SCTM-254-61(14) $1.00

Sandia Corp., Albuquerque, N. Mex.
AUTOMATIC TESTER FOR ELECTRICAL FUSES, BY C. D. Longerot. Mar 62, 41p.

SCTM-307-62-81 $1.60

Sandia Corp., Albuquerque, N. Mex.
RESISTANCE MEASUREMENT METHODS, by L. B. Converse. Rept. on Contract AT(29-1)-789. Jan 62, 11p.

PB 159 906 $3.60

Western Electric Co. [Winston-Salem] N. C.
INDUSTRIAL PREPAREDNESS STUDY. LACQUER FILM CAPACITORS, by B. Piechocki. Quarterly progress rept. no. 8, 25 Nov 60-25 Feb 61, on Contract DA 36-039-sc-81268.. [1961] 34p. AD-252 738.

DESCRIPTORS: *Capacitors, Manufacturing methods, Industrial production, Production, Quality control, Thin films, Cellulose acetates, Films, Coatings, Packaging, Tests, Varnishes.

The results of the groups of capacitors subjected to the complete range of tests as required for preproduction sample approval was unsatisfactory. As a result, the effort has been primarily directed toward process analyses and a reevaluation of production techniques. Modifications in the lacquering, winding, and terminating areas has been reflected in significant improvement of the electrical characteristics of the capacitor. Designed experiments have been conducted to study the effects of various parameters to determine the control limits for electrical growth and stabilization during the life test. The data currently available indicates that the eventual quality of the capacitor can be predetermined very early in the process. (Author) (See also PB 153 380)

Mechanical Engineering

UCRL-6152 $1.25

Lawrence Radiation Lab., U. of California, Livermore
OPTIMIZING OF FLOW PARAMETERS FOR THE EXPANSION OF VERY LOW-QUALITY STEAM, by Kenneth F. Neusen. Rept. on Contract W-7405-eng-48. 25 Jan 62, 54p. 7 refs.

UCRL-6230 $1.50

Lawrence Radiation Lab., U. of California, Livermore.
A STUDY OF THE EXPANSION PROCESS OF LOW-QUALITY STEAM THROUGH A DE LAVAL NOZZLE, by Daniel J. Maneely. Rept. on Contract W-7405-eng-48. 25 Jan 62, 62p. 9 refs.

Ordnance, Missiles, and Satellite Vehicles

AD-273 666 repriced $0.75

Aerospace Medical Research Labs., Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
FAR FIELD NOISE AND VIBRATION LEVELS PRODUCED DURING THE SATURN SA-1 LAUNCH. PRELIMINARY REPORT, by J. N. Cole and C. E. Thomas. (Directorate of Engineering Test). Rept. on Biodynamic Environments of Aerospace Flight Operations [and] Measurement Analysis of Induced Environments. Dec 61, 30p. ASD Technical rept. 61-607.

DESCRIPTORS: *Guided missiles, Guided missile launchers, *Launching, *Noise, Sound transmission, Instrumentation, Launching sites, Rocket motor noise, Measurement, *Vibration, Statistical functions.

Acoustic measurements were made of the sound pressure level-time functions which were produced at six locations on Cape Canaveral Missile Test Annex (CCMTA) and at four locations in the surrounding

communities during the Saturn SA-1 launch on 27 October 1961. The frequency range of measured data was from the 4.7 to 9.4 cps octave band to the 4800 to 9600 cps octave band. Distances from the launch site to the noise measuring sites ranged from 3700 to 100,000 feet. Vibration data were taken at three locations at the Tel-2 telemetry site. The frequency range of measured data was from the 4.5 to 9 cps octave band to the 1125 to 2250 cps octave band. The distance from the launch site was 5200 feet. Only the basic sound pressure level-time environments and vibration level-time environments and vibration level-time environments as a function of octave bands of frequency are presented in this report. (Author)

PB 159 894 $2.60

Air Force Missile Test Center, Patrick AFB, Fla.
FIELD EVALUATION OF ASKANIA CINE-THEODOLITES (INSTRUMENT NUMBER 630), by E. Stern and B. S. Lewis. July 56, 24p. Quality Control Technical note no. 15-D; AFMTC-TN-56-54; AD-96 603.

DESCRIPTORS: *Phototheodolites, Theodolites, Test methods, Tests, Quality control, Errors, Corrections

The results of a field test on Askania Number 630 are described. Test and analysis procedures applied are the same as those used on previous Quality Control field tests. This test indicates that the standard deviations are approximated by 14 seconds of arc in azimuth and 9 seconds of arc in elevation under static conditions and 13 seconds of arc in azimuth and 10 seconds of arc in elevation under semi-dynamic conditions. These are similar to test results of Askania Number 670. The bias is shown to be 54 seconds in azimuth and -14 seconds in elevation. (Author)

PB 159 888 $6.60

Firestone Tire and Rubber Co., Akron, Ohio.
DEVELOPMENT OF SOLID RUBBER-TIRED PLASTIC RIM WHEEL ASSEMBLIES AS A REPLACEMENT OR ORDNANCE PART NUMBER D-7013976, by V. E. Lucas, L. V. Cooper, and B. G. Labbe. Final rept. on Contract DA 33-019-ORD-2904. Jan 61, 701. AD-254 305.

DESCRIPTORS: *Tanks, *Road wheels, Design, *Plastics, Glass textiles, Resins, Esters, Polymers, Epoxy resins, Tires, Fluorides, *Rubber, Molding, Ethylenes, Wheel hubs, Resin adhesives.

The metal mold for a light-weight solid rubber-tired reinforced-plastic wheel assembly to replace the steel assembly for combat tanks was redesigned to improve the rubber-to-plastic adhesion, and to permit molding of the rubber tread on the plastic wheel without damaging the pre-molded plastic wheel. An improved molding technique and recipe for good plastic wheel moldings from fiber-glass-reinforced polyester resins were developed. Dummy molds were fabricated of reinforced polyester resins to permit curing the tread to the steel rims which were later added to the design. A molding technique was developed for handling glass reinforced epoxy resin. Easy mold separation and removal of the epoxy wheel was achieved by coating the mold with teflon. An improved hub ring was designed to provide better support for the wheel hub. The wheel assembly was redesigned with the rubber tread adhered to a heat conducting steel rim which was secured to the plastic wheel. Four wheels had the rubber adhered to the plastic. Six wheels of polyester and 1 of epoxy had the heat-conducting steel rims to which the rubber tread was adhered.

AD-273 064 repriced $15.00

Frebank Co., Glendale, Calif.
DESIGN AND DEVELOPMENT OF NON-MODULATING PRESSURE CONTROL DEVICES, by Ernest A. Lamont and Melville D. Ferguson. Vol. II of rept. on Design, Development and Testing of Non-Modulating Pressure Control Valves, Contract AF 04(647)429. Dec 61, 221p. AFBMD TN-60-18; Frebank rept. no. 160; AFBSD-TR-61-71, v. 2.

DESCRIPTORS: Space flight, *Guided missiles, *Control valves, *Gas valves, Valves, *Pressure regulators, Pressure switches, *Safety valves, Design, Tests, Specifications, Feasibility studies

This report contains specifications, drawings, and a report (also available separately as PB 153 615, mi$5.70, ph$16.80) on the feasibility study portion of the contract.

Order from GPO $0.65 as NAS 1.12:102

National Aeronautics and Space Administration, Washington, D. C.
ANALYSIS OF ERRORS AND REQUIREMENTS OF AN OPTICAL GUIDANCE TECHNIQUE FOR APPROACHES TO ATMOSPHERIC ENTRY WITH INTERPLANETARY VEHICLES, by David P. Harry, III and Alan L. Friedlander. 1961, 69p. 24 refs. NASA Technical rept. R-102.

DESCRIPTORS: Spaceships, *Space flight, Guidance, *Atmosphere entry, Planets, *Planetary atmospheres, Astrophysics, *Optical systems, Digital computers, *Numerical methods and procedures, Errors.

An analysis and Monte Carlo statistical evaluation of a potentially self-contained guidance scheme based on a clock and optical instrumentation are presented. Finite errors in all measurements and control action are considered, as well as planet surface knowledge. Requirements on system components are inferred from parametric studies. A range of entry velocities from 40,000 to 63,000 fps, entry corridors as small as a 8 mi., and instrument accuracies from 20- to 120-sec arc are considered. A multiple-correction scheme is found capable of controlling the approach to an entry corridor using instruments of modest capability and requiring a relatively small corrective velocity increment. (Author)

Order from GPO $0.45 as NAS 1.12:87

National Aeronautics and Space Administration, Washington, D. C.
STUDY OF THE POSITIONS AND VELOCITIES OF A SPACE STATION AND A FERRY VEHICLE DURING RENDEZVOUS AND RETURN, by John M. Eggleston and Harold D. Beck. 1961, 40p. 7 refs. NASA Technical rept. R-87.

DESCRIPTORS: *Orbital flight paths, *Satellite rendezvous vehicles, *Spaceships, Satellite vehicle trajectories, Velocity, Space navigation.

Families of nonthrusting ascent trajectories during rendezvous with an orbiting space station and the descent trajectories to the earth's atmosphere are studied. Equations of motion are derived and results are shown for two typical orbits of the station (one circular and one elliptic orbit). Boundaries of launch (at time of booster burn-out) and rendezvous conditions are given and the effects of delays in launch time are discussed. (Author)

Sanitation and Safety Engineering

UCRL-9711 $2.00

Lawrence Radiation Lab., U. of California, Berkeley.
PROCEDURES FOR THE DESIGN AND OPERATION OF HAZARDOUS RESEARCH EQUIPMENT. Rept. on Contract W-7405-eng-48. 31 Oct 61, 75p. 7 refs.

WT-1421 $6.60

Sandia Corp., Albuquerque, N. Mex.
EVALUATION OF BURIED CONDUITS AS PERSONNEL SHELTERS. Operation Plumbbob. 14 July 60, 70p. 35 refs.

WT-1422 $9.10

Sandia Corp., Albuquerque, N. Mex.
EVALUATION OF BURIED CORRUGATED-STEEL ARCH STRUCTURES AND ASSOCIATED COMPONENTS. Operation Plumbbob. 28 Feb 61, 110p. 34 refs.

FOOD, HANDLING, AND PACKAGING EQUIPMENT

AD-268 479 $2.25

Operations Research Office, Johns Hopkins U., Bethesda, Md.
RADIATION-PROCESSED FOODS AS A COMPONENT OF THE ARMED FORCES FEEDING SYSTEMS, by John M. Barnes, Donald M. Boyd and others. Aug 61, 94p. 100 refs. Staff paper no. ORO-SP-174.

DESCRIPTORS: *Food, *Radiation effects, Processing, Preservation, Purification, *Military rations, Combat, *Feeding, Acceptability, Logistics.

The possible operational, economic, and logistical advantages that might accrue to the armed forces through the introduction of radiation-processed foods into the feeding system were investigated for the 1965-1975 time frame. This study is intended to provide a basis to enable the Army to determine requirements for the irradiated-food research program and to assist the Army in making decisions regarding the construction and operation of a pilot plant for radiation processing of foods. Radiation-processed foods and foods processed by other means are compared for best operational ration support of military personnel in a theater of operations. The scope includes an analysis of the current technological status of radiation preservation of foods and the additional research effort needed to attain fully acceptable products for incorporation into military rations. Attention was given to various concepts of military feeding and the tactical operational requirements of various types of armed-forces units for support rations. Particular consideration was given to the logistical implications involved in the integration of irradiated components in military rations, including savings in manpower, storage, equipment, supplies, and dollar costs. (Author)

PB 158 200 $12.00

Quartermaster Food and Container Inst. for the Armed Forces, Chicago, Ill.
FOOD PREFERENCES OF MEN IN THE U. S. ARMED FORCES, by David R. Peryam, Bernice W. Polemis and others. Jan 60, 163p. 14 refs.

DESCRIPTORS: *Food, Acceptability, Statistical analysis, Military personnel, *Military rations.

MACHINERY, FABRICATION, AND ACCESSORY EQUIPMENT

AGN-8034 $2.75

Aerojet-General Nucleonics, San Ramon, Calif.
DESIGN AND OPERATION OF 1800°F PUMPED BOILING RUBIDIUM LOOP SYSTEM AND DETERMINATION OF DENSITY AND VAPOR PRESSURE RUBIDIUM BETWEEN 174° AND 1800°F. Final rept. 1 Feb 60-31 May 61, on Contract AT(04-3)-251. Mar 62, 164p. 12 refs.

HW-71980 $0.50

Hanford Atomic Products Operation, Richland, Wash.
AXIAL EXPANSION OF LATHE SPINDLES, by J. H. Rector. Rept. on Contract AT(45-1)-1350. Dec 61, 12p.

TID-15121 $3.60

Stanray Corp., Chicago, Ill.
STUDY OF THE FEASIBILITY OF SHIPPING THE FIRST SPENT CORE FROM ELK RIVER, MINN., TO POLICORO, ITALY, by Stephen J. Fraenkel. Final rept. 1 Aug 61-15 Sep 61, on Contract AT(11-1)-963. 15 Sep 61, 32p.

Manufacturing Equipment and Processes

PB 159 885 $6.60

Electronic Defense Labs., Mountain View, Calif.
OPTIMAL SYSTEM SUPPLY, by Frank Proschan. Rept. on Contract DA 36-039-sc-78281. 7 Jan 60, 69p. 25 refs. Engineering rept. no. EDL-E38; AD-233 591.

DESCRIPTORS: *Supplies, Statistical analysis, *Logistics, *Scheduling, Military requirements, Costs, Maintenance.

Extension is made of previous work by Guy Black and Frank Proschan (Operations Research 5:7, Sept.-Oct., 1959) which shows how to calculate minimum cost spare part kits yielding specified assurance against shutdown due to shortage in a complex military system. Optimal policies are determined for both the situation in which only the initial spare parts kit may be used to replace failed components (single-period model), and the situation in which periodic replenishment of the spare part kit occurs (multi-period model); in the multi-period model, constant lag in delivery is permitted. The only input data required are component costs and failure distributions (assumed exponential in the multi-period model); knowledge of component usage rates is not required. Actual applications of the single period model to certain large military systems are briefly described.

PB 181 106 $1.00

Office of Technical Services, Dept. of Commerce, Washington, D. C.
GOVERNMENT-OWNED INVENTIONS AVAILABLE FOR LICENSE ACCUMULATED JANUARY 1961 THROUGH DECEMBER 1961. [1962] 123p. 1,107 refs. Patent Abstract Series, suppl. no. 4.

DESCRIPTORS: *Patents, *Instrumentation, Design. *Bibliography, *Inventions

Supplements in one volume all volumes of the previous series, PB 111 464 - PB 111 470, Dec 53, PB 111 854, Jan 54 - June 55, PB 151 506 - PB 151 512, June 55 - June 58, and PB 171 672 - PB 171 678, July 58 - Dec 60.

Contents: Instrumentation; chemical products and processes; food products and processes; metal processes and apparatus, machinery, and transportation equipment; electrical and electronic apparatus; ordnance; ceramic, paper, rubber, textile, wood, and other products and processes. For each invention the title of the invention, the United States Patent number, the name of the inventor, the name of the Government agency administering the patent, and an abstract of the patent of the invention are given. Evaluation of the invention with respect to its industrial application is facilitated by an examination of the technical data contained in the abstract

MATERIALS

Order from GPO $0.50 as I 28.27:8054

Bureau of Mines, Washington, D. C.
HYDROGENATION OF LOW-TEMPERATURE COAL TAR AND RELATED MATERIALS: A SUMMARY OF THE LITERATURE, by Howard W. Wainwright. 1961, 85p. 164 refs. Information Circular 8054.

DESCRIPTORS: *Coal tar, Hydrogenation, *Bibliography.

DC-58-7-45 $2.60

General Electric Co., Cincinnati, Ohio.
SYNTHETIC ORGANIC FLUIDS FOR USE IN THE TEMPERATURE RANGE FROM ROOM TEMPERATURE TO 1000°F, MILESTONE I, TASK 4334-1-1 (FORMERLY TASK 1470), by C. G. Collins. Status rept. on Contract AT(11-1)-171. 1 July 58, 26p.

ORO-518 $2.60

Southern Research Inst., Birmingham, Ala.
THE TRUE STRESS-STRAIN PROPERTIES OF BRITTLE MATERIALS TO 5000°F, by Frank J. Digesu. Monthly rept. no. 5 on Contract AT(40-1)-2694. 19 Jan 62, 25p. Rept. no. 5103-1190-XIX.

PB 159 899 $2.60

Washington State [U.] Engineering Experiment Station, Pullman.
DEVELOPMENT OF A NEW DRY TYPE FACSIMILE PAPER, by Homer J. Dana. Final rept. on Contract N7onr-330/II. 18 Dec 51, 24p. AD-37 757.

DESCRIPTORS: *Facsimile paper, Paper, Preparation, Dehydration, Recording paper, Facsimile recording systems

It was the objective to discover and develop a dry, uncoated paper, not sentitive to light or time and capable of being inscribed by the passage of sparkless current through the sheet itself. A paper meeting these requirements was developed which will mark under currents ranging from 3 to 45 ma at 40 to 100 volts. It was discovered that the color of the inscription could be controlled to some extent by the choice of metal for the inscribing stylus. The higher the speed of inscription the higher is the required voltage and current. Experiments with supersonic vibrations, with x-rays and with cathode rays did not yield any significant results in connection with this project. Furthermore, in addition

to the chemical compounds which were found to give positive color reaction to the passage of electric current, a list is furnished which did not show any capabilities for use in recording. A list of all the patents bearing on the subject of facsimile recording indicates the continued and extensive interest in this field. (Author)

Ceramics and Refractories

GEMP-9A $1.75

General Electric Co., Cincinnati, Ohio.
HIGH-TEMPERATURE MATERIALS PROGRAM. Progress rept. no. 9, Part A, on Contract AT(40-1)-2847. 30 Mar 62, 70p. 8 refs.

GEMP-10A $0.75

General Electric Co., Cincinnati, Ohio.
HIGH-TEMPERATURE MATERIALS PROGRAM. Progress rept. no. 10, part A, on Contract AT(40-1)-2847. 16 Apr 62, 29p. 16 refs.

ORNL-3164 $2.00

Oak Ridge National Lab., Tenn.
EFFECTS OF FAST-NEUTRON IRRADIATION AND HIGH TEMPERATURE ON BERYLLIUM OXIDE, by R. P. Shields, J.E. Lee, Jr., and W. E. Browning, Jr. Rept. on Contract W-7405-eng-26. Apr 62, 87p. 27 refs.

MATHEMATICS

ORNL-3259 $0.50

Oak Ridge National Lab., Tenn.
A GENERALIZED LEAST SQUARES PROGRAM FOR THE IBM 7090 COMPUTER, by M. H. Lietzke. Rept. on Contract W-7405-eng-26. Apr 62, 16p.

ORNL-3200 $1.00

Oak Ridge National Lab., Tenn.
THE TWENTY GRAND PROGRAM FOR THE NUMERICAL SOLUTION OF FEW-GROUP NEUTRON DIFFUSION EQUATIONS IN TWO DIMENSIONS, by M. L. Tobias and T. B. Fowler. Rept. on Contract W-7405-eng-26. Apr 62, 34p. 1 ref.

PB 159 901 $1.60

Ohio State U. [Columbus].
STATISTICAL TECHNIQUES APPLICABLE TO THE ANALYSIS OF A FUNDAMENTAL RANDOM PROCESS, by Henry B. Mann. Rept. on Contract AF 33(616)74. Sep 52, 14p. Technical note WCRR-52-7; AD-131 787.

DESCRIPTORS: *Statistical processes, Statistical tests, Probability, Statistical distributions, Statistical functions.

Order from GPO $0.40 as D 7.15:3

Sibley School of Mechanical Engineering, Cornell U., Ithaca, N. Y.
SAMPLING PROCEDURES AND TABLES FOR LIFE AND RELIABILITY TESTING BASED ON THE WEIBULL DISTRIBUTION (MEAN LIFE CRITERION), by Henry P. Goode and John H. K. Kao. Quality Control and Reliability Technical rept. no. 3 on [Contract Nonr-401(43)].30 Sep 61, 58p. 24 refs.

DESCRIPTORS: *Statistical distributions, *Electronic equipment, Statistical analysis, Probability, *Reliability, *Sampling, *Life expectancy, Quality control, Time, Tests, Design, Tables, Statistical tests, Military requirements.

This technical report presents a proposed acceptance-sampling procedure together with tables of sampling plans for life and reliability testing when the underlying life distribution of items is of the Weibull form. The procedures and plans are for use when inspection of the sample items is by attributes with the life test truncated at some specified time. Lot quality is evaluated in terms of mean item life. A set of conversion factors has been provided from which attribute sampling-inspection plans of any desired form may be designed for the Weibull model or from which the operating characteristics of any given plan may be determined. In addition, a comprehensive collection of Weibull sampling-inspection plans has been designed. Also included are tables of ratios for adapting the Military Standard 105B plans to life testing and reliability applications. (Author)

PB 159 891 $12.50

Virginia Agricultural Experiment Station, Blacksburg
LECTURES ON THE THEORY OF LEAST SQUARES, by R. Lowell Wine and William A. Glenn. Technical rept. no. 35 on Research in Statistical Problems: Multiple Regression Measures of Variation, Mixed Distributions Reliability, Designs, Contract DA 36-034-ORD-1527. Dec 57, 180p. 37 refs. AD-150 255.

DESCRIPTORS: *Least squares method, Theory, Statistical distributions, Matrix algebra.

Contents:
General model - examples
Simple application of the least squares method - linear regression
The multivariate normal distribution
Estimation of parameters in the linear regression models
Inverting a matrix and methods of solving for regression coefficients
Properties of the regression coefficients
Sums of squares and common tests of regression coefficients
Topics related to least squares
Analysis of variance
Estimation of components of variance

ACNP-62001 $8.60

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
PATHFINDER ATOMIC POWER PLANT ANALOG SIMULATOR, by D. H. Crimmins, D. Mohr, and J. T. Stone. Rept. on Contract AT(11-1)-589. 31 Jan 62 96p.

PB 159 914 $9.60

Integrated Range Mission, White Sands Missile Range, N. Mex.
STUDY OF MAGNETIC STORAGE DEVICES, by Klaus G. Schroeder. Final rept. 31 Mar 60, 120p. 103 refs. Proj. no. 516-09-003.

DESCRIPTORS: *Data storage systems, *Memory devices, Magnetic tape, Magnetic recording systems, Magnetic cores, Physical properties, Electrical properties, Digital computers.

This report summarizes "magnetic storage" methods and devices. It appears useful to classify the vast number of different devices in two major groups -- surface storage and bistable element storage. Information storage on a magnetic surface or in a bistable magnetic element are described. The physical and electrical characteristics of commercially available magnetic storage devices and equipment are tabulated for comparison and reference. A glossary of standard terms and definitions for the properties and functions of computer memories, tape recorders and reproducers, and magnetic cores is included. An appendix contains a description of two of the most widely used procedures for testing square-loop cores. (Author)

MND-C-2501 $4.50

Martin [Marietta Corp.] Baltimore, Md.
APWRC-CSDP, A GENERALIZED FORTRAN-II PROGRAM FOR AUTOMATED CROSS SECTION DATA REDUCTION AND ANALYSIS, by R. S. Hubner. Rept. on Contract AT(30-1)-2431. 31 May 61, 391p. 26 refs.

AD-270 573 $9.60

Moore School of Electrical Engineering, U. of Pennsylvania, Philadelphia.
THE MULTI-LIST SYSTEM. PART I. THE ASSOCIATIVE MEMORY, by N. S. Prywes, W. I. Landauer and others. Technical rept. no. 1, pt. 1, v. 1, on Contract Nonr-551(40). 30 Nov 61, 111p. 7 refs. Moore School rept. 62-10.

DESCRIPTORS: *Data processing systems, Documentation, Digital computers, Programming, Memory devices.

The problems of real-time information retrieval and of facilitating man-machine communications as applied to large data processing systems and to artificial intelligence are discussed. The system is composed of a simulated associative memory and the Multi-List processor. The system is open ended and automatically expandable in both data and man-machine communication languages. An attempt is made to apply competence in several areas of the computer field to the joint problem of real-time information retrieval and man-machine communications. Specifically, the areas of information retrieval, automatic programming, symbolic languages, computer system organization and logical design are dealt with. (Author)

AD-270 572 $11.00

Moore School of Electrical Engineering, U. of Pennsylvania, Philadelphia.
THE MULTI-LIST SYSTEM. PART II. MULTI-LIST PROCESSOR, APPROACH A. PART III. MULTI-LIST PROCESSOR, APPROACH B, by S. Litwin, N. S. Prywes, and H. J. Gray. Technical rept. no. 1, pt. 2 and 3, v. 2, on Contract Nonr-551(40). 30 Nov 61, 146p. 15 refs. Moore School rept. 62-10.

DESCRIPTORS: *Data processing systems, Digital computers, Programming.

Contents:
Part II. Multi-list processor organization and timing
Organization and timing of central processor
Built-in automatic programming
Part III. Processor organization
Processor instructions
Built-in automatic programming
(See also AD-270 573)

ORNL-3199 $1.00

Oak Ridge National Lab., Tenn.
EQUIPOISE-3: A TWO-DIMENSIONAL, TWO-GROUP, NEUTRON DIFFUSION CODE FOR THE IBM-7090 COMPUTER, by T. B. Fowler and M. L. Tobias. Rept. on Contract W-7405-eng-26. Apr 62, 36p. 5 refs.

ORNL-3263 $0.50

Oak Ridge National Lab., Tenn.
IBM-7090 GAUSSIAN INTEGRATION PACKAGE WITH OPTIONAL POINT QUADRATURE, by S. K. Penny. Rept. on Contract W-7405-eng-26. Apr 62, 8p. 2 refs.

ORNL-3198 $1.00

Oak Ridge National Lab., Tenn.
NIGHTMARE: AN IBM 7090 CODE FOR THE CALCULATION OF GAMMA HEATING IN CYLINDRICAL GEOMETRY, by M. L. Tobias, D. R. Vondy, and Marjorie P. Lietzke. Rept. on Contract W-7405-eng W-7405-eng-26. Apr 62, 40p. 6 refs.

SC-4672(M) $4.60

Sandia Corp., Albuquerque, N. Mex.
CALINT PROGRAMMING SYSTEM FOR CDC-160 COMPUTER, by David L. Beckedorff and M. Katherine Weston. Rept. on Contract AT(29-1)-789. Feb 62, 46p. Supersedes SCTM 377-61(54).

SCTM-304-61-81 $0.75

Sandia Corp., Albuquerque, N. Mex.
MULTIAPERTURE FERRITE CORES FOR INFINITE TIME CONSTANT MEMORY DEVICES, by H. J. Jensen. Rept. on Contract AT(29-1)-789. Mar 62, 33p. 86 refs.

MECHANICS

PB 159 913 $1.60

David Taylor Model Basin, Washington, D. C.
AN EXPERIMENTAL STUDY OF SINGLE BUBBLE CAVITATION NOISE, by Mark Harrison. Doctoral thesis. Rev. ed. Nov 52, 19p. 9 refs. Rept. 815; ATI-197 244.

DESCRIPTORS: *Bubbles, Cavitation, *Cavitation noise, Noise, Dynamics, Measurement, Nozzles, Sparks.

An experimental study of the noise produced by a single cavitation bubble has been made. The noise consists principally of a transient pressure pulse associated with the collapse of the bubble. The motion of the bubble has been photographed simultaneously with the measurement of the pressure pulse. (Author)

DC-60-6-37 $1.60

General Electric Co., Cincinnati, Ohio
FABRICATION AND CALIBRATION OF A SMALL DIAMETER FLOW NOZZLE FOR PROBE CALIBRATION (MILESTONE V, TASK 4341-1-1), by F. E. Simkins. Rept. on Contract AT(11-1)-171. 1 June 60, 15p.

PB 159 884 $6.60

Institute of Flight Structures, Columbia U., New York.
NONAXIALLY-SYMMETRIC MOTIONS OF CYLINDRICAL SHELLS, by I. Mirsky and G. Herrmann. Technical note no. 3 on Contract AF 18(600)1247. Dec 56, 61p. 5 refs. CU-11-56-AF-1247-CE; AFOSR-TN-56-591; AD-115 018.

DESCRIPTORS: *Cylindrical bodies, Structural shells, Motion, Energy, Deformation, Stresses, Shear stresses, Harmonic analysis, Wave analysis, Propagation, Numerical analysis.

A Timoshenko-type theory of cylindrical shells, developed by the authors in a previous paper for the case of axial symmetry, is generalized presently to include non-axially-symmetric motions. As an application, the propagation of free harmonic waves in the axial direction of a shell of infinite extent is studied and discussed in the light of previous work on this problem. (Author)

PB 159 902 $8.10

Massachusetts Inst. of Tech. Div. of Sponsored Research, Cambridge.
ENTRANCE EFFECTS IN A DEVELOPING SLUG FLOW, by Raphael Moissis and Peter Griffith. Technical rept. no. 18 on Contract Nonr-1841(39). June 60, 90p. 19 refs. DSR Proj. no. 7-7673; AD-238 385.

DESCRIPTORS: *Fluid flow, Fluid mechanics, *Bubbles, Pressure, Density, Theory, Analysis.

The kinetics of a Taylor bubble, as it rises behind a series of other bubbles in a gas-liquid slug flow, were determined. The rise velocity of a bubble is expressed as a function of separation distance from the bubble ahead of it. Using this information, the pattern of development of bubbles which initially enter a tube at regular intervals is determined by means of finite difference calculations. The density and, to a first approximation the pressure drop, of the developing flow are then calculated from continuity considerations. The density distribution in the entrance region is found to be a function of flow rates of the two phases, of distance from the inlet, and of initial bubble size. Density calculated by the present theory is compared with experimental measurements by the present and other investigators. Theory and experiments are generally in good agreement. (Author)

Aerodynamics and Pneumatics

DC-57-1-55 $3.60

General Electric Co., Cincinnati, Ohio
EXPERIMENTAL INVESTIGATION OF THE AERODYNAMIC PERFORMANCE FOR SEVERAL BICONVEX STRUT CONFIGURATIONS IN DUCTS, by C. R. Weeden and R. L. Jones. Rept. on Contract AT(11-1)-171. 31 Dec 56, 40p.

PB 159 889 $1.60

Institute of Engineering Research, U. of California, Berkeley.
A NOTE ON THE FLAT PLATE DRAG COEFFICIENT, by S. A. Schaaf. Technical rept. on Fluid Flow and Heat Transfer at Low Pressures and Temperatures, Contract N7onr-295, T. O. 3. 20 Feb 50, 11p. 18 refs. HE-150-66; Series no. 20-66; ATI-91 265.

DESCRIPTORS: *Sheets, Aerodynamics, Drag, Gas flow, Compressible flow, Shear stresses, Heat transfer, Pressure, Temperature.

ANL-6329 $0.50

Argonne National Lab., Ill.
LAMB WAVES, by Roberta A. di Novi. Status rept. on Contract W-31-109-eng-38. Mar 62, 21p. 12 refs.

PB 159 904 $11.00

Battelle Memorial Inst., Columbus, Ohio.
EVALUATION OF MAGNESIUM-LITHIUM ALLOYS FOR POSSIBLE MISSILE AND SPACE APPLICATIONS, by T. G. Byrer, R. J. Jackson and others. Final rept. 26 Dec 57-1 Jan 60 on Contract DA 33-019-ORD-2593. 31 Jan 60, 144p. 15 refs.

DESCRIPTORS: Guided missiles, Satellite vehicles, Rockets, Materials, Alloys, *Magnesium alloys, *Lithium alloys, Preparation, Melting, Casting, Physical properties, Mechanical properties, Welding, Corrosion, Tests, Pressure vessels, Construction, Sodium, Chemical reactions.

Investigations were conducted on known and experimental alloys in the ultralight magnesium-lithium system to determine their potential usefulness in missiles and space vehicles. On the basis of this research, two magnesium-lithium-base alloys, developed at Battelle and designated LA141 and LA91, appear to possess particularly favorable properties for both structural and nonstructural applications. LA141 and LA91 can be melted and cast either by conventional open-air flux methods or in a closed system under partial pressures of inert atmospheres. Both alloys are amenable to fabrication by a wide variety of methods; cast ingots can be extruded, hammer or press forged, or rolled directly to sheet. Both materials exhibit a high degree of formability at room or slightly elevated temperatures, and can be joined by conventional fusion- and resistance-welding techniques.

ORNL-3245 $0.50

Oak Ridge National Lab., Tenn.
AGING PHENOMENA IN COLUMBIUM-BASE ALLOYS, by D. O. Hobson. Rept. on Contract W-7405-eng-26. Apr 62, 21p. 7 refs.

OTS SB-489 $0.10

Office of Technical Services, Dept. of Commerce, Washington, D. C.
OXYGEN STEEL MAKING. FOREIGN LITERATURE. Feb 62, 11p. 115 refs. OTS Selective Bibliography SB-489.

DESCRIPTORS: *Bibliography, Translations, *Steel, Processing, *Oxygen, Metallurgy, Copper, Lead, Smelting.

Lists 115 translations of foreign reports available to February 1962 on the metallurgy of oxygen top-blowing processes; the Kaldo, L-D and other processes; dust removal and treatment of waste gases; bottom-blown converters; arc, rotary, reverberatory, and basic oxygen furnaces; oxygen processes in smelting copper, and lead among other subjects.

Structural Metallurgy and Corrosion

BMI-1571 $0.75

Battelle Memorial Inst., Columbus, Ohio.
ZIRCALOY-4 CORROSION IN HALIDE SOLUTIONS AND AT CREVICES IN HIGH-TEMPERATURE WATER, by Warren E. Berry, Earl L. White, and Frederick W. Fink. Rept. on Contract W-7405-eng-92. 19 Mar 62, 29p. 5 refs.

HW-72266 $1.60

Hanford Atomic Products Operation, Richland, Wash.
EFFECT OF OXYGEN ON HYDROGEN PICKUP OF ZIRCALOYS DURING AUTOCLAVING, by H. P. Maffei. Rept. on Contract AT(45-1)-1350. 9 Jan 62, 14p.

Order from GPO $0.45 as NAS 1.12:103

National Aeronautics and Space Administration, Washington, D. C.
THEORETICAL ELASTIC STRESS DISTRIBUTIONS ARISING FROM DISCONTINUITIES AND EDGE LOADS IN SEVERAL SHELL-TYPE STRUCTURES, by Robert H. Johns and Thomas W. Orange. 1961, 34p. 8 refs. NASA Technical rept. R-103.

DESCRIPTORS: *Structural shells, Spheres, Cylindrical bodies, Deformation, Stresses, Conical bodies, Shear stresses, Moments, Theory, Joints, Mathematical analysis, Guided missiles, Spaceships, Airframes, Design, Load distribution, Equations, Elasticity, Mechanical properties.

The deformation and complete stress distribution are determined for each of the following edge-loaded thin shells; (1) a right circular cylinder, (2) a frustum of a right circular cone, and (3) a portion of a sphere. The locations of maximum circumferential and meridional stresses are also found. Equations are developed for discontinuity shear and moment at the following junctions; (1) axial change of thickness in a circular cylinder, (2) axial change of thickness in a cone, (3) change of thickness in a portion of a sphere, (4) a cylinder and a cone, (5) a cylinder and a portion of a sphere, (6) a cylinder and a flat head, and (7) a cone and a portion of a sphere. (Author)

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ENGINEERING EVALUATION STUDIES: HEAVY WATER MODERATED POWER REACTOR PLANTS. Quarterly progress rept. Oct-Dec 61, on Contract AT(38-1)-213. 25 Jan 62, 65p.

DP-691 $0.50

Savannah River Lab., Aiken, S. C.
FABRICATION QUALITY OF HWCTR DRIVER TUBES, by R. C. Pugh. Rept. on Contract AT(07-2)-1. Mar 62, 16p. 4 refs.

SRO-65 $1.10

Savannah River Operations Office, Ga.
HEAVY WATER POWER REACTOR PROGRAM MONTHLY PROGRESS REPORT, FEBRUARY 1962. 10p.

DPST-62-162 $3.60

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CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC., RESEARCH AND DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR THE PERIOD OCTOBER, NOVEMBER, DECEMBER 1961, Rept. on Contract AT(30-3)-222.

YAEC-159 $2.75

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YAEC-184 $2.50

Westinghouse Electric Corp., Pittsburgh, Pa.
THE STARTUP EXPERIMENT PROGRAM FOR THE YANKEE REACTOR, by J. M. Gallagher, Jr. H. W. Graver, Jr., and D. Hunter. Rept. on Contract AT(30-3)-222. June 61, 124p. 13 refs.

WCAP-1900 $5.60

Westinghouse Electric Corp., Pittsburgh, Pa.
THERMOELECTRIC NUCLEAR FUEL ELEMENT, by G. R. Klip, W. P. Blankenship, and others. Final rept. on Contract AT(30-3)-500. 10 Feb 62, 57p.

Nuclear Reactions

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Argonne National Lab., Ill.
NEUTRON SCATTERING ANGULAR DISTRIBUTION, by A. Langsdorf, Jr., R. O. Lane, and J. E. Monahan. Rept. on Contract W-31-109-eng-38, Oct 61, 189p.

CF-60-11-8 $3.60

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COMPILATION OF REQUESTS FOR NUCLEAR CROSS SECTION MEASUREMENTS, comp. by J. A. Harvey. 4 Nov 60, 38p.

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P.E.C. Corp., Boulder, Colo.
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TID-15078 $1.60

Wisconsin U., Madison.
NUMERICAL CALCULATIONS OF MULTIPLE COULOMB EXCITATION CROSS SECTIONS, by R. Graetzer, R. Hooverman, and E. M. Bernstein. Rept. on Contract AT(11-1)-Gen-7. 1961. 12p.

Radioactivity

CEX-58.4.2 $1.00

Atomic Energy Commission. Div. of Biology and Medicine, Washington, D. C.
AERORADIOACTIVITY SURVEY AND AREAL GEOLOGY OF THE SAVANNAH RIVER PLANT AREA, SOUTH CAROLINA AND GEORGIA (ARMS-I), by Robert G. Schmidt. Mar 62, 41p. 27 refs.

CEX-59.7C $0.50

Edgerton, Germeshausen and Grier, Inc., Santa Barara, Calif.
METHODS AND TECHNIQUES OF FALLOUT STUDIES USING A PARTICULATE SIMULANT, by William Lee and Henry M. Borella. Feb 62, 22p. 13 refs.

PB 159 897 $5.60

Ford Instrument Co., Long Island City, N. Y.
FALLOUT PREDICTOR, by A. Richter. Quarterly rept. no. 1, 1 July-30 Sep 58, on Contract DA 36-039-sc-78185. [1958] 59p. 97 refs. AD-208 066.

DESCRIPTORS: Atomic bomb explosions, *Nuclear explosions, Explosions, *Atomic clouds, *Radioactive fall-out, Mathematical prediction, Wind, Meteorology, Shear stresses, Digital computers, Programming, *Radiation instruments.

A study was made of a system to predict the pattern produced by radioactive debris from a nuclear explosion as it falls to the ground. The final system will consider the effect of bomb cloud development and structure, winds, rainout, topography, and particle setting rates. Previous systems were studied to determine the suitability of the method and the ways in which the methods may be improved. The development of various relations using a general purpose digital computer is discussed. The National Bureau of Standards solution is reviewed. This solution was programmed for a general purpose digital computer to provide a preliminary study of the application of digital techniques to the solution of the fall-out problem. A digital computer program to produce a prediction identical in all significant respects to that produced by the NBS predictor is discussed and simplified flow charts are presented for an improved program based on the NBS prediction. (AEC abstract)

HASL-122 $3.00

Health and Safety Lab., Atomic Energy Commission, New York.
FALLOUT PROGRAM, by Edward P. Hardy, Jr., Joseph Rivera, and Robert Frankel. Quarterly summary rept. 1 Dec 61-1 Mar 62. 1 Apr 62, 214p. 53 refs.

NYO-9530 $2.25

Isotopes, Inc., Westwood, N. J.
STUDIES OF NUCLEAR DEBRIS IN PRECIPITATION, by Alan Walton and Ralph E. Fried. Summary progress rept. no. 7, on Contract AT(30-1)-2415. 15 Aug 61, 105p. 12 refs.

PHYSICS

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Ames Lab., Iowa State U. of Science and Tech.
AN INTEGRATION OF THE BCS EXPRESSION FOR THE CRITICAL FIELD OF SUPERCONDUCTORS, by C. A. Swenson. Rept. on Contract W-7405-eng-82. Jan 62, 21p. 13 refs.

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GUIDE TO THE LITERATURE ON PLASMA OSCILLATIONS, by Winston M. Gottschal, Harold F. Feeny, and Bruce C. Lutz. Technical rept. no. 1 on Contract AT(30-1)-2440. June 61, 28p. 234 refs.

UCRL-6766 $0.50

Lawrence Radiation Lab., U. of California, Livermore
REPLICA TECHNIQUES IN ELECTRON MICROSCOPY, by Carl J. Wensrich. A bibliography. Rept. on Contract W-7405-eng-48. Feb 62, 20p.

Electronics

UCRL-9969 $3.00

Lawrence Radiation Lab., U. of California, Livermore and Berkeley.
CONTROLLED THERMONUCLEAR RESEARCH SEMI-ANNUAL REPORT, July-Dec 61, on Contract W-7405-eng-38. 19 Jan 62, 230p. 87 refs.

LAMS-2682 $0.50

Los Alamos Scientific Lab., N. Mex.
LASL CONTROLLED THERMONUCLEAR RESEARCH PROGRAM. Quarterly status rept. for period ending 20 Feb 62, on Contract W-7405-eng-36. 30 Mar 62, 13p. 3 refs.

MATT-63 $2.50

Plasma Physics Lab., Princeton U., N. J.
PRELIMINARY STUDIES OF A REFLEX ARC, by R. L. Bingham, F. F. Chen, and W. L. Harries. Rept. on Contract AT(30-1)-1238. 1 Feb 62, 138p. 26 refs.

Thermodynamics

ANL-6505 $1.50

Argonne National Lab., Ill.
AN INVESTIGATION OF ENTHALPY DATA FOR WATER AND WATER VAPOR IN THE CRITICAL REGION, by E. S. Nowak and R. J. Grosh. Rept. on Contracts AT(11-1)-1026 and W-31-109-eng-38. Sep 61, 65p. 72 refs.

ANL-6508 $1.25

Argonne National Lab., Ill.
ON THE EQUATION OF STATE FOR WATER AND WATER VAPOR IN THE CRITICAL REGION, by E. S. Nowak and R. J. Grosh. Rept. on Contracts AT(11-1)-1026 and W-31-109-eng-38. Nov 61, 54p. 166 refs.

ANL-6497 $1.00

Argonne National Lab., Ill.
SPECIFIC HEAT DATA ANALYSIS PROGRAM FOR THE IBM 704 DIGITAL COMPUTER, by Pat R. Roach. Rept. on Contract W-31-109-eng-38. Jan 62, 43p.

AD-271 000 $3.00

Armed Services Technical Information Agency, Arlington, Va.
CRYOGENICS AND LOW TEMPERATURE RESEARCH. AN ASTIA REPORT BIBLIOGRAPHY, comp. by Terry L. Gillum. Feb 62, 165p. 865 refs.

DESCRIPTORS: *Bibliography, *Cryogenics, *Low temperature research, Instrumentation, Materials, Superconductivity, Thermochemistry, Temperature, Measurement, Control, Adhesives, Elastomers, Liquefied gases, Gases, Lubricants, Metals, Propellants.

This bibliography was prepared in response to numerous inquiries concerning cryogenics and low temperature research. Citations are included for documents cataloged by ASTIA from 1953 through 1 February 1962, and are restricted to unclassified, unlimited references. The classified section of the bibliography appears separately as a secret document, identified as AD-327 650. References are arranged alphabetically by subject areas pertaining to low temperature research, instrumentation, and materials. These subject areas are further subdivided into more specific topics which include references on superconductivity, thermochemistry, temperature measurement and control, adhesives, elastomers, liquefied gases, lubricants, metals, and propellant research. (Author)

WAPD-252 $0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
THE ACCOMMODATION COEFFICIENTS OF HELIUM AND KRYPTON ON ZIRCALOY-2, by J. M. Markowitz. Rept. on Contract AT(11-1)-GEN-14. Feb 62, 24p. 11 refs.

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Bureau of Mines, Washington, D. C.
THE CHEMICAL THERMODYNAMIC PROPERTIES OF HYDROCARBONS AND RELATED SUBSTANCES. PROPERTIES OF 100 LINEAR ALKANE THIOLS, SULFIDES, AND SYMMETRICAL DISULFIDES IN THE IDEAL GAS STATE FROM 0° TO 1,000° K, by Donald W. Scott and John P. McCullough. 1961, 68p. 53 refs. Bulletin 595.

DESCRIPTORS: *Hydrocarbons, *Thermodynamics, Chemical properties, *Thiols, *Sulfides, Sulfur compounds, Organic compounds, Colorimetry, *Petroleum, Thermochemistry

DC-60-4-22 $5.60

General Electric Co., Cincinnati, Ohio.
INTERIM REPORT ON HTRE NO. 3 THERMODYNAMIC DATA, by W. C. Powell and A. W. Ratliff. Rept. on Contract AT(11-1)-171, 31 Mar 60, declassified 5 Dec 61. 61p.

TID-14632 $10.10

Institute of Engineering Research, U. of California, Berkeley.
FORCED CONVECTION BOILING STUDIES, by V. E. Schrock and L. M. Grossman. Final rept. on Forced Convection Vaporization Project, Contract W-7405-eng-48 for Lawrence Radiation Lab., U. of California, Livermore. 1 Nov 59, 123p.

SAN-1002 $2.00

Institute of Engineering Research, U. of California, Berkeley.
REACTOR HEAT TRANSIENT RESEARCH, by H. A. Johnson, V. E. Schrock and others. Annual summary rept. on Contract AT(11-1)-34. Nov 61, 96p. 8 refs. Series no. 163; issue no. 2.

LAMS-2673 $2.00

Los Alamos Scientific Lab., N. Mex.
SURFACE FITTING OF THE EQUATION OF STATE OF LIQUID AND GASEOUS NORMAL HYDROGEN, by R. K. Zeigler, P. C. McWilliams, and W. E. Keller. Rept. on Contract W-7405-eng-36. 4 Apr 62, 88p. 5 refs.

Wave Propagation

PB 159 907 $9.10

Antenna Lab., Ohio State U. Research Foundation, Columbus.
MEMORANDUM ON ELECTROMAGNETIC PROPERTIES OF THE HYPERSONIC PLASMA SHEATH, by William S. C. Chang. Rept. on Radome Optics Study (Cm to Mm Range), Contract AF 33(616)5410. 30 June 60, 102p. 47 refs. Rept. no. 786-29; AD-240 445.

DESCRIPTORS: *Electromagnetic properties, *Plasma physics, Hypersonics, Gas ionization, *Radomes, Microwaves, *Radar antennas, Airborne, Hypervelocity vehicles.

An attempt was made to analyze, both theoretically (macroscopically and microscopically) and experimentally, the hypersonic plasma sheath from five points of view: (1) the conductivity and the permittivity of the plasma for weak signals: (2) non-linear properties of the plasma for moderately strong signals and the breakdown process of the very strong signals; (3) the transmission, reflection, and diffraction characteristics of the sheath; (4) the noise and plasma radiations; and (5) the radar echo areas and the Doppler frequency shifts of the plasma. Because of the lack of experimental data and the complexity of hypersonic flight conditions, the analyses are incomplete; however, the conclusions, the "best-analysis", and the "best-estimates" available as a result of current work are represented. (Author)

PB 161 635 $2.00

National Bureau of Standards, Boulder, Colo.
AIRBORNE TELEVISION COVERAGE IN THE PRESENCE OF CO-CHANNEL INTERFERENCE, by Martin T. Decker. Jan 62, 83p. 19 refs. NBS Technical note no. 134.

DESCRIPTORS: Ultra high frequency, Frequency, Airborne, *Television stations, *Television transmitters, Operation, Tests, Video signals, Radio interference, Interference, Probability, Signal-to-noise ratio, Television antennas, Antennas.

Predictions are made of the coverage to be expected from a network of airborne television transmitters operating in the UHF television band. Various system performance and interference conditions are assumed. The results are presented in a series of graphs with probability of service as a function of receiving location and in terms of the total effective area of a station or network of stations. System requirements for a coverage approaching 100% of a large area are indicated. (Author)

PB 151 377-12 $1.00

National Bureau of Standards, Boulder, Colo.
QUARTERLY RADIO NOISE DATA SEPTEMBER, OCTOBER, NOVEMBER 1961, by W. Q. Crichlow, R. T. Disney, and M. A. Jenkins. 23 Feb 62, 77p. 11 refs. NBS Technical note no. 18-12.

DESCRIPTORS: *Noise (Radio), Measurement, Tables.

See also PB 151 377-11

RESEARCH METHODS, TECHNIQUES AND EQUIPMENT

AD-258 626 $23.50

Computation Lab., Harvard U., Cambridge, Mass.
MATHEMATICAL LINGUISTICS AND AUTOMATIC TRANSLATION, by Anthony G. Oettinger. June 61, 457p. 108 refs. Rept. no. NSF-6.

DESCRIPTORS: *Computers, *Machine translation, USSR, Japan, Language, Selection, Automatic.

Contents:
"Automatic sentence diagramming"
"Russian -ся verbs, impersonally used verbs and subject/object ambiguity"
"Russian-English structural transfer: a preliminary system"
"Iterations for the syntactic analyzer"
"A preliminary approach to Japanese-English automatic translation"
"The insert-sift program"
"Modifications to the continuous dictionary run (III)"
"A modified system for english predictive analysis"
"The compilation run: a technical manual for making additions to the harvard automatic dictionary"
"A sequence list"
"A format for the output of an automatic translator"
"Adjectival government and infinitive prediction"
"The usage of Russian connectives"
"Bibliography of recorded Russian texts (III)"

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National Bureau of Standards, Washington, D.C. RESEARCH HIGHLIGHTS OF THE NATIONAL BUREAU OF STANDARDS. ANNUAL REPORT, FISCAL YEAR 1961. Dec 61, 204p. Miscellaneous Publication 242.

DESCRIPTORS: *Scientific research, Physics, Electronics, Measurement, Standards, Mechanics, Heat, Nuclear physics, Chemistry, Minerals, Metallurgy, Materials, Fibers, Applied mathematics, Data processing systems, Radio waves, Propagation, Radio, Cryogenics, Engineering.

MISCELLANEOUS

PB 181 072 $1.25, $10.00/year

Naval Research Lab., Washington, D. C. REPORT OF NRL PROGRESS. May 62.

DESCRIPTORS: *Naval research, *Scientific research, Lithium compounds, Fluorides, Optics, Ultraviolet spectroscopy, Meteorology, Analog computers, Atmosphere, Astrophysics, Atmospheric electricity, Light, Ruby, Lasers, Chemistry, Stability, Plants, Aquatic animals, Oils, Films, Thermoelectricity, Rare earth elements, Thermocouples, High temperature research, Mechanics, Numerical methods and procedures, Nonlinear systems, Metallurgy, Ceramic materials, Alloys, Fatigue (Mechanics), Nickel, Nitrogen, Argon, Oxygen, Niobium, Solutions, Density, Liquid metals, Bismuth, Steel, Corrosion, Alkali metal compounds, Steam, Hydroxides, Magnesium compounds, Ferrites, Nuclear physics, Half life, Radioactive isotopes, Cobalt, Cesium, Radio, Digital computers, Least squares method, Errors, Curve fitting, Radio communication systems, Radio transmitters, Naval communications, Electronic circuits, Germanium, Transport properties, Solid state physics Gamma rays, Phosphate glass, Vacuum apparatus, Cleaning, Sound, Velocity, Noise, Impedance, Pistons, Acoustics, Patents, Scientific reports.

Contents:
Articles:
Optical Properties of LiF in the Vacuum Ultraviolet, by D. A. Patterson and W. H. Vaughan
Project Tradewinds IV: Radiometeorological Conditions in the Elevated Duct between San Diego and Honolulu (June 22 and 26, 1961), by D. L. Randall
Scientific Program:
Applications Research: Analog computer equipment for demonstrating the reduction of task difficulty and the improvement in the accuracy of man-machine performance which derive from the use of "quickening"
Atmosphere and Astrophysics: Technique and apparatus for determining the distribution of ions in the atmosphere as a function of their mobility.... NRL semi-automatic atmospheric electricity station.... Light from a ruby laser propagated 45 km over the horizon at night
Chemistry: Stability of plankton-oil films to artificial light... Thermoelectric instability of some noble metal thermocouples at high temperatures ($1000^{o}C$ - $1700^{o}C$)
Mechanics: Graphical-numerical method for the determination of transient response of nonlinear systems
Metallurgy and Ceramics: Anisotropy of wrought alloys... Fatigue life of nickel in nitrogen, argon, and oxygen compared to that in vacuum as a function of temperature.... Field dependence of the Hall coefficient of Nb-25%Zr at $4.2^{o}K$, $77^{o}K$, and $317^{o}K$.... Density of solutions of nickel in liquid bismuth.... Corrosion of steel due to concentration of alkali in steam-generating systems: laboratory studies on concentrated LiOH at $316^{o}C$.... Quasiquantitative DTA determination of $Mg(OH)_2$ in ferrites
Nuclear and Atomic Physics: Half-lives of 29.68 ± 0.05 yr and $5.263 \pm .003$ yr determined, respectively, for the radioisotopes Cs^{137} and Co^{60}
Radio: Electronic digital computer program for least square error curve fitting.... shore-to-ship radio messages transmitted over the Navy's operational CMR circuit.... High-temperature effects on the conversion of the electronic transport properties of germanium
Solid-State Physics: Comparative study of the gamma-ray characteristics of three types of silver-activated phosphate glass.... Vacuum cleaver technique yields the ultimate in clean substrates
Sound: Encores for ACT I--system for LGP-30 digital computer-compiler.... Sound velocity and noise profiles.... Interaction mechanical radiation impedance between two pistons arbitrarily oriented in space without a baffle.

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